An Independent Audit of Forest Management on the Gordon Cosens Forest for the Period 2000 to 2005

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BioForest

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1.0 EXECUTIVE SUMMARY

BioForest Technologies Inc. carried out an independent audit of forest management on the Gordon Cosens Forest (GCF) covering the period from April 1, 2000 to March 31, 2005. Since 2001, the GCF has been managed under Sustainable Forest License (SFL) #550039 by Tembec Industries Inc. ("Tembec"). The audit examined Tembec's compliance with the terms and conditions of its SFL for the GCF and reviewed the Ontario Ministry of Natural Resources' (OMNR) performance in meeting its obligations on the GCF. The audit included an extensive review of the plans and records of forest management activities, along with field verification visits to areas where a variety of forest management activities occurred during the audit period. Public input was solicited through a public mailing, newspaper advertising, mail-in surveys, and public meetings.

This audit report identifies 10 recommendations and 10 suggestions, aimed at improving the management and administration of the GCF, along with two best practices. The main aspects requiring corrective action or improvement on Tembec's part relate to formalizing a program to close in bridge decks, finding a pragmatic solution to disposal of logging slash, and resolving outstanding Memorandums of Agreement on the Forest, either by securing agreements with commitment holders or by having the OMNR remove the requirement from its SFL.

The OMNR needs to address issues such as ensuring the Local Citizens' Committee (LCC) improves its operating performance, improving its program for approval of bridge design, defining staff roles for meeting planning inventory verification requirements, monitoring the efficacy and efficiency of guideline implementation, and completing an analysis of areas that are by-passed for harvest to confirm their commercial potential.

The audit recommends that OMNR confirm the willingness of Moose Cree First Nation to share values information and ensure the steering committee for the planning team monitor progress more aggressively in order to facilitate issue resolution in a timely manner.

The audit commends the Company for its efforts at working with the Moose Cree First Nation, and both the Company and OMNR for developing practical guidance for operations on wet soils.

Based upon its review of the evidence and observations, the audit team has concluded that the GCF is well managed and that the Licensee is satisfactorily meeting all of the terms and conditions of the SFL. OMNR is also meeting its overall responsibilities associated with its role in managing this forest. The audit team confirms that, based on the evidence reviewed, management of the Forest was in compliance with the legislation, policy, and regulations that were in effect during 2000-2005 audit term. The GCF is being managed sustainably. The audit team has recommended that the term of Sustainable Forest License #550039 be extended for an additional five years.

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2.0 INTRODUCTION

An Independent Forest Audit (IFA) of the Gordon Cosens Forest (GCF) was undertaken in the autumn of 2005 to ensure that forest management activities were carried out in accordance with the plans, guidelines, regulations and legislation in force during the five years from April 1, 2000 to March 31, 2005. This audit was carried out in compliance with the *Crown Forest Sustainability Act* (CFSA) (Statutes of Ontario 1994) and fulfills the requirements of the *MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario* (Ontario Ministry of Environment and Energy 2003). The audit assessed the effectiveness of forest management activities in achieving the management objectives for the GCF. Also examined was the compliance of Spruce Falls Inc., a wholly owned subsidiary of Tembec (hereinafter referred to as "Tembec," the "Company," or the "SFL holder"), with the terms and conditions of its Sustainable Forest License (SFL) #550039 for the GCF, signed on May 9, 2001. Finally, the audit reviewed the Ontario Ministry of Natural Resources' (OMNR) performance in meeting its obligations on the GCF.

The audit was conducted under the guidance of the 2005 *Independent Forest Audit Process and Protocol* (IFAPP) (OMNR 2005a). The IFAPP outlines eight specific principles upon which the audit is based; these are listed in Appendix C. These principles define the major features of forest management that were audited. Each principle is supported by a series of criteria. For each criterion, a number of procedures are listed in the IFAPP specifying what is to be checked and what evidence should be available for the auditors to use to assess compliance with the criteria. Performance on this audit is measured and assessed by considering all principles collectively. Failure or non-compliance against any individual criterion or principle has been noted where appropriate. In total, the protocol identifies 147 criteria that were applicable to this forest and assessed as part of the audit. The audit team analyzed findings from the criteria. This report summarizes the findings, highlighting performance as it relates to the criteria evaluated, and presents recommendations, suggestions and best practices. Recommendations have been presented where, in the opinion of the audit team, the auditees have not met a performance requirement, or where an observation or a collection of observations has led the auditors to conclude that there is an issue of concern. The audit team expects the auditees will create, document and implement specific remedies for recommendations. Suggestions have been made where areas of relative weakness have been found in the program. Best practices have been noted where the auditees have clearly exceeded requirements, and have demonstrated significant leadership or innovation in doing so.

2.1 Audit Process

The auditors collected evidence through document review, interviews with staff and stakeholders, and physical inspections of field activities that had occurred between April 1, 2000 and March 31, 2005.

The audit team conducted a review of documents that described activities on the Forest from 2000 to 2005. A partial list of the documents reviewed is included in Appendix E of this report, *Summary of Input to Audit Process*.

Interviews were held with a variety of interested parties. Company and OMNR staffs were interviewed throughout the auditing period. Most of these interviews took place in person, but contact between the audit team, auditees and the public by phone and e-mail was common.

Field visits were undertaken to assess compliance with plans and prescriptions and to assess the effectiveness of management activities. The lead auditor selected the sites by randomly identifying areas on a map that illustrated all forestry activities conducted on the GCF between April 1, 2000 and March 31, 2005. Field sites, selected by the lead auditor, were visited to evaluate the effectiveness of harvest, renewal, and free-to-grow (FTG) programs, as well as to conduct in-progress inspections of roads, areas of concern (AOCs) and other items of interest.

The audit process began with an initial visit to collect background information and documents from the auditees (Tembec and OMNR district staff) in Kapuskasing on June 24, 2005. An audit plan that set the schedule for the audit and identified the main contacts for the audit was written and distributed. Using the mailing list that the OMNR maintains for the GCF, a notice of a public meeting and a brief survey regarding forest management was distributed to all 605 stakeholders. The survey was also posted on the BioForest Technologies Inc. web page. A pre-audit meeting was held in Kapuskasing on August 23, 2005. The lead auditor completed initial field site visits on August 24, 2005 and completed field site selections on August 25, 2005. On-site and field audit activities were carried out in Kapuskasing between October 3 and October 7, 2005. A public meeting was held in Kapuskasing on October 4, 2005, and a meeting with the Local Citizens' Committee (LCC) was held on the evening of October 5, 2005.

The objective of the site visits was to assess forest operations that had been carried out between April 1, 2000 and March 31, 2005. The audit team verified records and information systems in the Tembec and OMNR offices. Three and one half days were spent in the field sampling operations. The team split into three field crews. Each field crew was accompanied by Tembec and OMNR staff. A representative from the LCC accompanied one audit team through each field day, as did an observer from the Wildlands League.

Field sampling was designed so that a minimum of 20% of the areas that had been harvested within the audit period was sampled. Tembec organizes their harvest and subsequent management activities by consolidating stand level information into operating blocks. The auditors reviewed the information and selected 105 site visit areas, covering some 13,457 ha of 67,915 ha depleted during the audit period. Of the 55 blocks the Company operated on through this audit period, the team evaluated some portion of 32 of them. The site visits were selected to evaluate harvest, renewal, tending/maintenance, FTG operations, and AOCs of all of the main operators on the Forest. Sites that had

multiple audit values (e.g. renewal and AOC) were preferentially selected. Sites visits were selected to ensure the audit team observed all geographic areas during the field inspections.

During the audit, four of the planned sites were not inspected. Poor weather curtailed one of two days spent doing aerial inspections. Six additional sites were added during the field audit.

In total, the audit team inspected 105 sites that had harvest activity, 87 sites that had renewal activity, 41 sites that had site preparation (mechanical or chemical), 48 sites that had been tended and 27 sites that had been declared FTG. During these inspections, the auditors made formal observations on 77 AOCs.

Sample testing was undertaken on the Forest Renewal Trust Fund accounts by visiting sites in the field for which reimbursements had been made for the 2003-2004 season. The *Specified Procedures Report* (KPMG 2005a and KPMG 2005b) was commissioned by OMNR during the audit term as a selected review of the reimbursements paid out to SFL companies under the terms of the Forest Renewal Trust Agreements. The sampling objective for the *Specified Procedures Report* (KPMG 2005a and KPMG 2005b) is similar to the objective for the operations sample, that is, approximately 20% of the sites identified in the report. A comparison of the sites identified in the *Specified Procedures Report* (KPMG 2005a and KPMG 2005b) to those sites visited by the audit team demonstrated that the actual sampling rate was approximately 24% overall. Locations of the sample sites actually examined in the field are illustrated in Figure 1 in Section 2.2.1 of this report.

As part of the audit, public input was solicited in a mailing to 605 individuals, institutions, and interest groups on OMNR's mailing list used for forest management planning notifications. The mailing included a survey form that was used to gauge public perception of forest management practices on the GCF, along with a notice for the public meetings held during the audit. The audit team received 25 responses to the survey, a return rate of about 4%. A public meeting was held on October 4, 2005. A meeting with the LCC was held on October 5, 2005. In addition to the meeting with the LCC, 17 LCC members were interviewed directly.

A team organized by BioForest Technologies Inc. carried out the audit. The audit team consisted of three Registered Professional Foresters, a biologist/ecologist, a socio-economist and a secretariat. Each member of the team was assigned specific duties and responsibilities. A list of the audit team members and their qualifications is presented in Appendix B.

2.2 Forest Management Context

The planning and overall administration of the GCF is the responsibility of Tembec and the OMNR. Hearst District has taken a lead role in facilitating the preparation and approval of this forest management plan (FMP).

The boundary of the GCF, along with site selections for this audit, is shown in Figure 1 in Section 2.2.1 of this report. The current boundary reflects the amalgamation of the southern portion of the Kapuskasing Crown Management Unit (CMU) with the GCF, which occurred on April 1, 2000. The GCF is situated in the Northeast Region of the OMNR. The boundary of the GCF overlaps four OMNR district boundaries including Cochrane, Chapleau, Hearst and Timmins Districts.

There are numerous communities located within the management unit including Strickland, Fauquier, Moonbeam, Kapuskasing, Val Rita-Harty, Opasatika and Mattice. There are no native communities within or adjacent to the management unit, although the Moose Cree First Nation has an interest in the Forest.

There are 11 companies that hold some sort of tenure to harvest or utilize timber produced from the GCF. These companies are Spruce Falls Inc. (Tembec – Kapuskasing), Excel Forest Products (Opasatika), Lecours Lumber Co. Limited (Calstock), Tembec Inc.- Hearst, Tembec Inc.-Timmins, Cayouette Cabinets, Grant Forest Products Inc. (Englehart and Timmins), Columbia Forest Products – Levesque Division (Hearst), St. Mary's Paper Ltd. (Sault Ste. Marie) White Cedar Products Inc., and Norbord Industries Inc. (Cochrane).

2.2.1 Map of Management Unit

Figure 1 presents a map of the GCF, including field sample locations.

2.2.2 Forest Description

The GCF is located primarily on the Northern Clay Belt of the Boreal Forest Region. Lacustrine deposits laid down by glacial Lake Barlow-Ojibway during the Post-Wisconsin period produced the Clay Belt, which is characterized by heavy clayey soils, up to 20 m in thickness, overlaying Pre-Cambrian granites, gneisses and schists. The Clay Belt is typically flat with muskeg and clay over bedrock and few gravel and sand ridges. The extreme southern sections of the GCF are typically sand plains and gravel ridges. This makes the Forest generally one of the most poorly drained in Canada.

The predominant tree species on the GCF is black spruce, however, other distinct forest types and associations can be found on a site-by-site basis. Black spruce is found on lowland areas in pure stands and in association with cedar and/or larch. Better-drained lowland sites (Spruce Flats) comprise approximately 33% of the land base and poorly

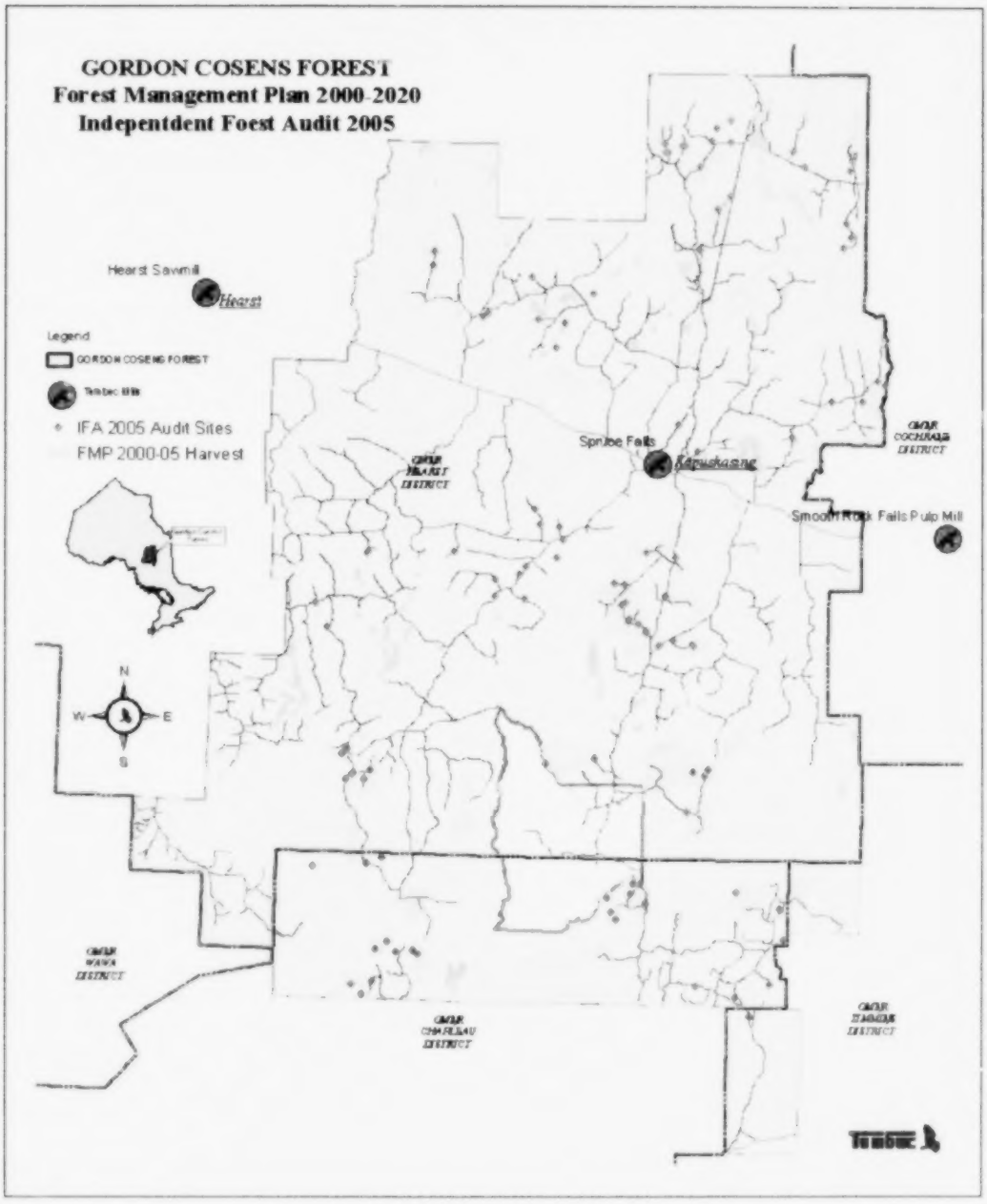

Figure 1. Map of the Gordon Cosens Forest. Field sample locations are shown in red.

drained sites (Spruce Swamps) make up about 10% of the Forest. The major lowland site types that are found on the GCF are Site Types 11, 12 and 13, with some minor occurrences on Site Types 8 and 9.

Approximately 18% of the forested area occurs on mineral soiled uplands in association with aspen, balsam poplar, white birch and balsam fir. These stands are upland mixed wood. Approximately 2% of the Forest is occupied by stands that are dominated by jack pine. These upland sites are characterized by deep, dry to fresh, sandy soils with generally less than 20 cm of organic material over the mineral soil. Aspen and white birch dominated stands occupy approximately 10% of the Forest.

2.2.3 Forest Management Issues

Forest management issues are part of public forest management in Ontario. As part of audit preparation, the auditors identified some 32 individual issues that are under active consideration. These have been consolidated into a list of seven issues that are of strategic importance to the management of this forest.

1) *Marketability of Under-utilized Species:* Under utilization results in missed opportunities for industry to use secondary wood fibre and generate additional economic benefit from this forest. Operational problems (regeneration is difficult and road costs have increased) are also encountered. Lack of solid inventory information affects the development of future markets for minority species.

2) *Major River Systems:* The harvest area calculated in this plan is based on the assumption that all allocable forest is available for access and forest management. Access constraints exist in the GCF due to the major river systems that divide the Forest in a north to south direction.

3) *Conflicts with Other Users:* There is potential for conflict with other users including remote tourism, anglers and hunters, native and non-native trappers and other affected parties. The concerns of these individuals and groups relate primarily to access. Due to the rapid deterioration of un-maintained forest access roads located in the Clay Belt, other forest users, such as trappers and recreational forest users, feel they are losing economic and recreational opportunities as roads that are no longer maintained become impassable for vehicles.

4) *Quality Fisheries Zone:* The Quality Fisheries Zones, primarily located in Chapleau district, presents a specific challenge to the planning team. Access planning must strive to maintain the integrity of these fisheries.

5) *Potential Reduction in Wood Supply:* There is potential for reduction in wood supply due to increased constraints. Some of these are operational constraints from the implementation of the *Forest Management Guide for Natural Disturbance Pattern Emulation* (NDPE) (OMNR 2001a). Forest Stewardship Council (FSC) certification

has required that the Company leave additional residual wood on harvest sites to meet biodiversity targets. There is predictable reduction in the harvestable wood because much of the Forest contains trees that are too young, too old or too scattered to be economically harvested. Significant decreases in wood supply lead to loss of economic opportunity and job losses.

6) *Aspen Use:* Aspen has traditionally been an under-utilized species. The increased use of this species will have effects on traditional management practices.

7) *High Conservation Value Forests (HCVF):* On April 4, 2003, Tembec was awarded an FSC certificate for its forest management practices on the GCF. As part of the FSC certification process, an assessment appropriate to the scale and intensity of forest management as required under Principle 9 was completed to determine the presence of attributes consistent with HCVF on the GCF. The development of mechanisms to maintain HCVF attributes (i.e. caribou and lake sturgeon) on the Forest could present unique challenges during plan development.

3.0 SUMMARY OF AUDIT FINDINGS

3.1 Commitment

Within the audit, commitment is assessed in terms of the existence of policy documents that provide a vision and mission to the forest management organization, while giving long-term guidance to the management of the organization. Commitment must also be evident in the day-to-day operations of the organization.

Tembec has mission and vision statements that address its commitment to sustainable management and has communicated this policy to its employees. Their mission statement commits to: "achieving and maintaining sustainable forest management and meeting or exceeding all relevant legislation, regulations, policies and other requirements to which the organization subscribes." These statements were visible on site during the audit, and were available to staff and the public on Tembec's corporate web site (http://www.Tembec.com/).

Tembec's commitment is refined within its Forever Green® environmental management system (EMS), and through third party verification to the ISO 14001 and FSC standards. It is not uncommon for Ontario forest companies to maintain an ISO 14001 certification, but Tembec was the first Crown boreal forest certified to FSC standards in Canada. Staff awareness of its environmental policies and certification standards is high.

Tangible evidence of Company commitment beyond the requirements of regulation was evident throughout the audit. Signs posted commemorating the planting of the 150, 200 and 250 millionth seedlings identified milestones in the reforestation effort. Staff located

records of early plantations (1951) at the request of the auditors, and clearly were aware of the significance of that early work. Local Company and OMNR knowledge of the Forest was excellent, a key indicator that the forest estate was being managed on a continuous basis.

OMNR has a number of initiatives that are directly related to forest management. These include: *MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario* (Ontario Ministry of Environment and Energy 2003), the *Old Growth Policy for Ontario's Crown Forests* (OMNR 2003), and the NDPE guide (OMNR 2001a); implementation of the *Forest Information Manual* (FIM) (OMNR 2001b); the ongoing creation, revision, and implementation of other resource management guidelines; and the regulation of protected areas through the Ontario Living Legacy (OLL) initiative. Ongoing implementation of these policies and guidelines are very important to maintaining the policy framework, and more importantly, to sustainable forest management. From the audit team's discussions with staff at all levels within the Hearst District, it was apparent that staff are familiar with corporate policies and guidelines and are committed to carrying out OMNR's mandate.

The OMNR also has a host of "environmental policies" that guide their regulatory efforts. Discussion with staff at all levels confirmed that they are familiar with these policies and committed to carrying out OMNR's mandate in this area.

3.2 Public Participation

3.2.1 Local Citizens' Committee

In order to understand the current climate of the LCC and public mood in general, it is important to be aware of some key facts and issues in the region. In the early part of 2005, Tembec announced the closure of its Opasatika Sawmill and the expansion of the Hearst Sawmill. While most of the employees at the mill had options to work at Hearst or retire early, the closure of the mill raised significant public anger among many individuals in the Region, with much of it directed at both Tembec and the OMNR. At least two different organizations, "Gordon Cosens Survival Group" and "Saving the Regions of Northern Ontario Group" (STRONG) have been organized in the region. While the mandate of both groups appears to be quite open ended, there is significant public concern in the region associated with the movement of wood fibre beyond the boundaries of the Forest. While the issue of mill closures and wood flow is beyond the scope of the audit, the overall public concern and sentiment is clearly spilling over into forest management planning and public consultation activities and is currently representing a challenge for both Tembec and the OMNR. The negative sentiment in the region has represented an increased public challenge for both organizations and many members of the public are clearly questioning the ability of both to manage the Forest. The public sentiment expressed at some public meetings and LCC meetings has been highly negative and has made LCC meetings difficult to manage. Increasingly, the public

is highly concerned about the overall economic sustainability of the industry, which is now a common concern across Northern Ontario. Interestingly, the OMNR gave a presentation to the LCC in 2004, on wood supply, wood flow, movement to larger mills and the economic consolidation of the industry in Northern Ontario. Many of the concerns that are being raised in the public now were identified as likely trends in this presentation. While there is no easy answer to these public concerns, it is important to understand how the current public environment is affecting the LCC.

The Gordon Cosens LCC has been in operation since the mid 1990s. Many of the current LCC members have been involved since that period and before. The LCC was reconstituted in 2002 because OMNR was concerned that the Committee had lost focus of the LCC mandate and was not functioning well. The reconstituted LCC was established with a new Terms of Reference that reflected the LCC's mandate as directed by the Forest Management Planning Manual (FMPM) (OMNR 1996). The new LCC allowed for any member of the community to participate if he or she wished. The Terms of Reference meets all the requirements and is a good guide for the Committee, however, some members acknowledged that it does not actually guide the activities of the Committee. While the LCC mailing list of individuals who have ever participated on the Committee is close to 100 individuals, there is a core of approximately 20 individuals who regularly participate. The core membership of the Gordon Cosens LCC consists of representation from: the local hunting/angling club, softwood and hardwood forest industry users, the general public, several of the local municipalities (including Kapuskasing, Moonbeam and Opasatika), tourist outfitters, education, trappers, and snowmobile clubs. The main interests that are lacking from the LCC include Aboriginal, environmental and mining interests. Several members of the LCC noted that it would be advantageous to have First Nations representation and efforts have been made, but the lack of a Reserve within the GCF means there is limited interest. Several members of the LCC have strong environmental concerns and are highly concerned about the sustainability of the Forest. No mining interest has come forward.

The audit team was impressed by the attitude and participation of the LCC during the audit. Members of the LCC noted concerns to the audit team, including wood supply, wood utilization, wood flow and licensing, slash, renewal, investment in silviculture, stumpage, clearcut size, lack of funding for the LCC, aerial spraying and wildlife issues.

The audit team believes that the OMNR has provided some educational opportunities associated with many of these topics, but in order to ensure interest we believe it is important for the OMNR to continually respond to the topical concerns of the LCC. OMNR has indicated that the provision of educational opportunities on these types of issues will be a key part of the LCC's agenda in the next year.

While certain members of the public and some members of the LCC were critical of OMNR and Tembec, others had high praise for the OMNR and the Company and their ability to work with the public on important issues of concern and in providing educational and training opportunities.

Several members of the GCF LCC are knowledgeable individuals with a great deal to contribute. The LCC member on the planning team was particularly engaged in planning team activities and his contribution was noted as being valued by several individuals. At the time of the audit, several LCC members raised their concerns that the LCC was lacking in effectiveness, meetings were often disorganized, agendas were not clearly set, many members bring very individual agendas rather than looking out for the broader public interest, and resolutions from previous meetings were not always acted upon. This represented the second period over the last five years where the level of organization of the Committee was challenged. The LCC has a somewhat hard-to-understand organizational structure, where the Vice-Chairperson, rather than the Chair of the Committee, chairs meetings (it should be noted that this is actually in conflict with the role of the Chairperson as identified in the Committee's Terms of Reference). This situation is compounded by the open door policy of the Committee, which allows any member of the public to participate. While this policy is highly democratic and very transparent, it most likely comes at the cost of efficiency and is particularly challenging when topics as complex as forest management planning are being addressed.

It would be more efficient for the organization if there were a single Chair who could capably manage meetings and ensure the Committee is following the requirements of the Terms of Reference. OMNR has recently provided a Community Liaison Coordinator to assist in the facilitation of the Committee's activities, helping the Committee in its organization and in developing a series of educational opportunities for committee members. The addition of this support person from OMNR will be a valuable resource for the LCC and should help the Committee in addressing some organizational issues. The OMNR Liaison Coordinator and the executive for the Committee currently meet before meetings in order to set the agenda for the meeting. The audit team is concerned that many of the valuable LCC members may lose interest in the Committee unless it can become more effective and organized.

No single recommendation will solve the current problem. We do think the OMNR is on the right track, however, effort must be made by OMNR, Tembec and all Committee members to ensure that the meetings are organized and that the Committee is effective. If the situation does not improve, the next logical move would be to employ a facilitator in order to ensure the proper flow of meetings. An effective LCC is a critical link in the forest management planning process and can prove to be an important conduit for addressing public concerns. It is essential that the effectiveness of the LCC is ensured, in particular, in a time when the industry and the OMNR face a great deal of public scrutiny.

Recommendation 1: OMNR must ensure that the Local Citizens' Committee follows its Terms of Reference and continues to address the procedural challenges of the Committee, including the organization and facilitation of meetings.

While the recommendation is directed to OMNR, it is essential that, if this LCC is to be effective, LCC members take responsibility for their own actions. For example, the LCC has to know its mandate and role in forest management and have an effective structure

and efficient communications to maximize its influence on the issues it advises on as part of its mandate.

3.2.2 FMP Standard Public Consultation Process

Public participation is solicited during the development and implementation of management plans based upon the requirements of the FMPM. During plan development, a multi-stage participation process provides the public with opportunities to comment on the plan at various points during its development. During plan implementation, the public has the opportunity to inspect Annual Work Schedules (AWSs) and is consulted on all major and minor amendments to the plan. The audit team verified criteria relating to general public consultation, focusing primarily on the production of the FMP.

The public participation requirements were met for the various planning activities undertaken on the GCF during the period of the audit. The various public notifications, direct mailings, and Information Centres were carried out as required, and in some cases, exceeded requirements. The opportunities for identifying issues and contacting the plan author to resolve specific issues of concern were communicated in all public notices, advertisements, and management plan summaries provided at the public Information Centres. A review of planning team meeting minutes and discussions suggest that information presented to the public at the various consultation opportunities met the standards of the day in terms of content and presentation. Public notices clearly communicated opportunities for concerned persons to make "bump-up" requests or consider utilizing the formal Issue Resolution process.

During the course of the audit, the team received 25 responses to its questionnaire, interviewed 17 LCC members, had 15 individuals attend a public meeting, and reviewed public input for the 2000 FMP. Public concerns about the Forest focused on future wood supply and allocation of harvested wood. Issues that were raised during the FMP process were either resolved or deferred. There remains a public concern on the part of a number of individuals about the Company's decision to close the sawmill in Opasatika, but that event is largely outside of the scope of this audit.

3.2.3 Native Peoples' Consultation

There are no First Nations communities located in or immediately adjacent to the GCF. However, the rivers of the GCF were important travel corridors for First Nations peoples prior to settlement and, therefore, the area is significant in terms of pre-historic and historic use. As part of its consultation on the Forest, OMNR notified 12 First Nations of the commencement of planning for the GCF. These 12 include: Moose Cree, Taykwa Tagamou, Constance Lake, Mattagami, Chapleau Cree, Chapleau Ojibway, Missinaibi Cree, Brunswick House, Flying Post, Hornepayne, Michipicoten and Beaverhouse. Of these 12, the Moose Cree, Taykwa Tagamou and Constance Lake were offered seats on

the planning team and the Native Consultation Process. None of the communities accepted the offer of the Native Consultation process and, while Constance Lake indicated an initial interest in the planning team, actual participation never materialized. It should be noted that all three of these First Nations have other forests of higher modern-day significance and priority to them than the GCF (Taykwa Tagamou Reserve is located north of Cochrane and their interests generally lie east of the Mattagami River in the Smooth Rock Falls Forest; Constance Lake is located west of Hearst and is primarily interested in the Hearst and Kenogami Forests and areas north of the area of the undertaking; the Moose Cree First Nation is highly involved in the Moose River Management Unit and the Northern Boreal Initiative). However, during the audit period, the Moose Cree First Nation took an increasingly strong interest in the GCF, and by 2002 was heavily engaged in some serious operational issues on the Forest and in discussions with Tembec on a variety of different topics. These issues associated with the Moose Cree have, therefore, received the attention of the audit team and are described below.

The Moose Cree First Nation has over 3,000 members, of which approximately half live on Reserve in Moose Factory. A staff member of the Moose Cree First Nation showed the audit team a map that illustrated that the traditional use area of Northeastern Ontario by the Moose Cree stretches as far south as Brunswick Lake and west to Mattice. It also extends east into neighbouring forests and well north into the Hudson Bay Lowlands. A number of individuals and families still utilize the GCF for trapping and other activities. A significant number of elders and younger individuals in the community spend long periods of time (e.g., several months) pursuing a traditional lifestyle on their traplines. The income that they earn from trapping is enough to support this traditional lifestyle. Trapping is very important to their lifestyle and livelihood.

A conflict arose in 2002 involving the Moose Cree and the trapline of one family. Access roads and water crossings to an operations block in the northeast section of the GCF were being constructed when a trapper from the Moose Cree identified his opposition to the harvesting of the area. Operations were immediately ceased, resulting in operational, wood flow and cost challenges for Excel Forest Products and Tembec. To the credit of both the companies, they immediately began to address the problem. It evolved into a larger debate over compensation and revenue sharing between Tembec and the Moose Cree First Nation. Discussions were held at the highest level of Tembec and the Moose Cree First Nation, as well as throughout various other management layers. Discussions culminated in a pilot program that resulted in a draft Revenue Sharing Agreement between Tembec and the Moose Cree First Nation and involved a confidential financial commitment from Tembec. The Agreement was completed (but not approved) in early 2005. Subsequently, Chief and Council of the Moose Cree First Nation sought the input of its members on the Agreement. At the time of the audit, the Agreement remained unsigned, but was clearly in the hands of the Moose Cree First Nation.

While the Agreement originated out of a conflict between trapping and harvesting and a desire for compensation, it is clear that the individual and collective parties involved see the Agreement, and the process leading to the Agreement, as one of respect, relationship building and recognition of the rights of the various parties.

Best Practice 1: Tembec's efforts at working with the Moose Cree First Nation on a variety of operational and relationship issues are at the forefront of industry and First Nations relations in Ontario.

The situation with the Moose Cree First Nation represented an example of the challenges associated with working with native trappers. These trappers, whose lifestyle and income can be impacted by timber harvesting, are increasingly making requests for very significant funds and/or goods to compensate them for their loss of trapline area. Forest products companies and the local OMNR offices respond to these concerns as they arise, but these cases would likely be assisted by a more common set of ground rules on how to address the problem.

Suggestion 1: Provincially, OMNR should consider developing a common set of ground rules, procedures and/or policies on how to address native trappers' issues.

A Native Background Information Report was prepared for the 2000 and the 2005 FMPs. Neither planning process included formal First Nations consultation programs. It should be noted that OMNR has a good knowledge of identified native values on the landbase. These values are almost exclusively associated with riparian areas that would normally be protected through riparian and shoreline reserves. The audit team was also very comfortable with how both OMNR and Tembec have promoted communications with First Nations on the GCF, even though it is not the first forest of interest for these First Nations.

During the audit, one of the team members visited the Moose Cree First Nation. A significant amount of oral history research work has been done by the Moose Cree First Nation, including interviews with elders who live in Kapuskasing. Some of this oral history pertains specifically to areas of the GCF and is potentially an important source of values information. Assuming that it is acceptable to the Moose Cree First Nation, it would be very important to ascertain if this would reveal new values information. Given the potential importance of this information, it is recommended that OMNR first ascertain if this information is potentially useful and then develop a protocol with the Moose Cree First Nation on how it could be used to ensure protection of the values.

Recommendation 2: OMNR is to determine whether the Moose Cree First Nation is willing to share its values information and, if so, identify whether the information is useful for values protection and, if it is, then develop a protocol as to how the values information is to be used in forest management planning.

3.2.4 Annual Work Schedule Public Inspection

An assessment of the various public notifications and direct mailings that are required prior to the implementation of annual operations revealed that all of the requirements are being fulfilled. Notification advertisements for the aerial spray programs are being

placed in the local newspapers, as required. Tembec has been diligent in responding to the public's requests for further information.

3.3 Forest Management Planning

Forest management planning is the foundation for the sustainable use of Ontario's forests. Plans have been prepared to the requirements of the FMPM. Tembec produced the 2000 FMP for the GCF. The audit team's review of the FMP and planning team activities focused on the production of the 2000 FMP. The auditors also reviewed the performance of the planning team for the 2005 FMP.

3.3.1 Planning Team Activities

The auditors assessed the planning team's performance for both the 2000 plan and the current 2005 plan, because the team was convened and functioning in the term of this audit. Comments are focused on the current plan because it is of more immediate concern to the assessment of sustainability. The planning team was well qualified and had considerable experience. Twenty-six monthly meetings over the course of the plan development were well attended. Minutes of the meetings were exceptionally well kept throughout the planning exercise and they were concise and clear.

On a practical side, despite a very experienced team, or possibly because of it, there was difficulty in coming to resolution on some key issues. In meetings as late as October and November of 2004, after "required alterations" had been received, there were still outstanding issues such as: age class substitution, Osprey Guidelines, Fisheries Guidelines, Beardmore Access strategy and Cultural Heritage Guidelines. Also, the planning team was not apprised of Tembec's discussions with environmental groups about the completion of protected areas in the northeast region. Consequently, important information was not brought before the planning team due to the confidential nature of the discussions. All of these items resulted in a considerable amount of work late in the planning cycle. All planning team and steering committee members consulted felt that the situation needed to be improved. Interviewees described the importance of letting the discussion play out and allowing the team to come to its own conclusions. However, a close reading of the minutes and discussions with the members indicated that there was too much entrenchment of positions and, probably due to the experience on the committee, this was difficult to overcome. There is no doubt that the team addressed some very challenging issues and produced a plan that is of high quality and, most importantly, practical. The team maintained a professional and polite relationship through some difficult issues. The post planning "debriefing" meeting was a worthwhile event. Efforts to maintain the morale of the team during the exercise were probably beneficial. Nevertheless, our conclusion was that the steering committee needed to play a stronger role in issue resolution, either directly or indirectly.

Recommendation 3: The Steering Committee for the planning team should monitor team progress more aggressively to facilitate resolution of issues and ensure all pertinent information is brought forward in a timely way.

3.3.2 Resource Stewardship Agreements

The Tourism and Forest Industry Memorandum of Understanding, June 7, 2000 (RSA Working Group 2000), established a framework for negotiating Resource Stewardship Agreements (RSA). The RSAs were not a requirement for plans approved in 2000, and, as such, have not been formally evaluated in this audit. The Company has included an objective in its 2005 FMP to maintain opportunities for resource-based tourism.

3.3.3 Source of Direction

A review of the planning team minutes confirmed the guides and policies that were used as sources of direction for the production of the 2000 FMP. Sections 1.4.1 and 2.3.2.1 of the 2000 FMP broadly describe the documents that were referenced. The FMP text indicates that Provincial guidelines and regional and district land use guidelines were used.

The auditors' review of the AWSs confirmed that guide requirements, AOC prescriptions, and stand level requirements are being properly documented and carried forward from the FMP. Field observations confirmed that performance was within normal operating standards and met the requirements of the directly relevant guidance documents.

3.3.4 Introduction

Introductory sections of the 2000 FMP contain the mandatory Statement of Environmental Values (SEV) briefing note, which is prepared by OMNR, and the index to the environmental components of the plan. Both of these documents met the FMPM requirements.

3.3.5 Management Unit Description

The forest description found in the 2000 FMP met the requirements that were in effect at the time of its approval. The forest description tables included in the plan adhere to the required formats and the figures listed (e.g., breakdown of productive forest, unproductive forest, total areas, working group totals) are consistent among the tables.

The 2000-2020 FMP has a well-prepared forest description, which covers administration, geology, soils, climate, and historic forest condition.

The historic forest condition is well described, covering both the cultural and natural disturbance patterns which have influenced the forest condition. The Company's analysis of historic fires is well described and provides excellent insight into the landscape patterns resulting from fire.

The GCF Forest Resource Inventory (FRI) was created in 1986 and has been continually updated to reflect management activities. The Kapuskasing CMU inventory is 1994 vintage and was updated and combined into the GCF FRI. Both inventories were properly updated for use in the 2000-2020 FMP.

Prior to the OMNR re-assuming responsibility for the implementation and cost of the FRI, Tembec had designed and begun implementation on the Romeo Malette Forest of a technologically advanced re-inventory process that will be used on other forests under its tenure, including the GCF. Completion of this effort will be a major step forward in forest ecosystem management on this forest. Although implementation of this inventory is beyond the scope of this audit, the Province and the Company are strongly encouraged to complete the inventory and consider it as a template for application on other forests in the Province.

The OMNR District maintains the values maps and accompanying attribute information in its Natural Resources Values Information System (NRVIS). All existing resource values for the GCF have been updated, based on historic and more recent survey information. The database includes occurrences of vulnerable, rare, threatened and endangered species on the Forest, and numerous other values including wildlife habitat, fish habitat, commercial tourism establishments, trap lines and cabins, bear management areas, recreational areas, etc.

The recommendation noted in Section 3.2.3 of this report has been written to improve the values based information on the Forest. If the values information from the Moose Cree First Nation is provided, it may result in a more comprehensive understanding of native history and values on this forest.

The 2000-2020 FMP included a description of the social and economic context of the Forest. It included all the required information on demographics and migration, the economic environment, and investment intention. The audit team also reviewed the socio-economic impact analysis done on the 2005 FMP and noted that there was more detail in the analysis compared to many other plans. The analysis correctly pointed out the lack of industrial diversification and high dependency on wood-using industries for the communities along the Highway 11 corridor. The audit team is of the opinion that the planning team is highly aware of the importance of their decisions with respect to the economies of the local communities.

3.3.6 Objectives and Strategies/Management Alternatives

The objectives for the 2000 FMP were prepared in accordance with the requirements of the FMPM and address the four broad categories as required by the CFSA, namely, forest diversity, social and economic matters, provision for forest cover, and silviculture.

One of the key exercises in preparing an FMP is using analytical tools to determine the expected future forest condition and estimating the implications of applying each particular management alternative relative to the desired outcomes or benefits over time. The provincially supported forest modeling software used in Ontario is known as the Strategic Forest Management Model (SFMM). The model requires hundreds of input records and constraints, ranging from operability limits and natural succession rates to post-harvest renewal rates and expected future yields. The auditors' examination of the SFMM inputs used in the 2000 FMP revealed that the inputs used were reasonable.

Nine management alternatives were evaluated in the 2000 FMP, including the three mandatory alternatives required in the FMPM and six additional alternatives. A number of suggestions proposed by the LCC were incorporated into the additional alternatives. The SFMM formulation used to develop the nine management alternatives examined in the plan was based upon sound assumptions regarding forest growth, forest succession, roads and landings. Growth and yield data were developed by site type using Tembec Permanent Sample Plot (PSP) data. The PSP program has been operational for 50 years. The quality of the PSP data provides the audit team with a high level of confidence in the assumptions supporting the forest growth analysis.

The nine management alternatives were examined and judged by the planning team and reviewed by the LCC. Analysis provided in the 2000 FMP confirms differences among the alternatives were relatively subtle. The rationale for choosing the selected management alternative (i.e., balanced objective achievement, managed forest) is well-documented in the 2000 FMP.

Overall, the evaluation of the management alternatives was well documented. Outputs described in the comparison of management alternatives are consistent with the SFMM output file and document the long-term sustainability of the Forest. The selected management alternative was projected to provide for a sustainable forest estate for the long-term.

The 2000-2020 FMP accurately presented the available harvest area by forest unit. Values are consistent between the plan and the SFMM formulation of the selected management alternative. Harvest allocations put forth in the plan vary marginally from the areas selected by modeling the selected management alternative.

All alternatives project a wood supply decline of 10% to 15% over the next 30-year period and this will be a dominant driver of economic opportunity on the GCF until timber harvest levels recover and stabilize. The audit team received comment from some stakeholders expressing concern that planning and operational assumptions, such as

substituting planned harvest areas with younger areas, could exacerbate the problem. Further, several comments were received suggesting the application of management guidelines, such as the NDPE guide, was having a measurable impact on wood supply. The management alternatives considered included a useful and acceptable analysis of these impacts. Further monitoring will be required to confirm the accuracy of the modelling assumptions. This is addressed in Section 3.6.1, *General Monitoring*.

The alternative chosen by the planning team and the LCC had the best over-all assessment score of the nine alternatives examined. When examined for objective achievement, the selected management alternative had the highest rating by providing maximum social and economic benefits, while meeting non-timber objectives. Socio-economic impacts were calculated for each alternative using the Socio-Economic Impact Model (SEIM). Values were compared across all nine management alternatives to rank each alternative.

All planned road construction and reconstruction was shown on the eligibility maps and presented to the public. New road construction projects were appropriately mapped, along with the alternative corridors that were considered. All the planning requirements were met for access planning.

Eligibility criteria are identified in the plan for the silvicultural activities of harvest and renewal. Eligibility maps were prepared based upon the eligibility criteria.

3.3.7 Operational Planning

Operational planning includes the allocation of areas for operations, the layout of harvest areas, the planning of forest access, and the development of AOC prescriptions. An AOC is the technical planning term for a forest value that has had a detailed prescription developed to protect it from potential adverse impacts of forest management operations. Normally, an AOC is protected through a prescription outlined in specific management guidelines appropriate to the value. Forest values information is collected and maintained in a digital format by the OMNR in their NRVIS.

AOC planning undertaken for the 2000 FMP included consideration of alternative methods of operations, when required, that supported the protection of the AOC value. Alternate prescriptions were clearly identified in the AOC Supplementary Documentation, when required, and the rationale explained. AOCs were identified and labelled on license maps, including reserve width where possible. There appeared to be adequate information for planning the AOCs. Specific prescriptions and silvicultural practices were well documented and appropriate for protecting the AOCs.

The 2000 FMP contains more than 100 silvicultural ground rules (SGRs) that are comprehensive, well structured, and reflect the current level of silvicultural understanding on the GCF. The plan text provides definitions for the terminology used in the SGRs (e.g., harvest methods, renewal treatment types, cleaning methods), includes

rationale as to why the treatments are applied, and describes how the treatments are applied. It is clear from the SGR content that the plan author has considered the experience and knowledge of local staff in their development. The silvicultural treatment packages were fully documented within the plan.

Four exceptions to the SGRs were noted in the plan. All had to do with research trials on forest tending operations.

Eligibility criteria used in the management plan were consistent with those found in the wood supply model formulation for the selected management alternative. The areas selected for harvest, renewal and tending were consistent with those used in modeling the selected management alternative. The rationale for these criteria was clearly explained in the plan.

The 2000 FMP forecasts the harvest depletion level for each forest unit and age class as required. Natural depletions were not expected to be significant over the five years of the plan and thus would have no impact on the achievement of management objectives. One year of contingency areas were documented and mapped.

The management plan addressed all wood supply commitments on the Forest. There are 11 commitment holders on the GCF, each of whom was allocated the appropriate volume of fibre in the 2000 FMP.

The silviculture program forecast in the 2000 plan was consistent with the silvicultural strategy for the selected management alternative as modelled in SFMM. A comparison of the selected management alternative and the actual harvest and renewal forecasts found an insignificant difference between the two.

Access planning and development on the GCF were well done. The long-term access pattern on the Forest has been thoughtfully developed. Primary and secondary roads are well planned and fully documented. Tembec staff planned more than 560 km of road construction in the 2000 plan, covering 22 construction or reconstruction projects.

Table 27 in the 2000 FMP for the GCF forecasts the revenues and expenditures associated with the operations described in the plan. The silvicultural revenues forecast ($30.5 million) are greater than the silvicultural expenditures ($25.2 million) by more than $5 million dollars. This surplus is maintained through the duration of the long-term forecasts for the selected management alternative.

The 2000 FMP discusses compliance monitoring including methods and procedures. Appendix 7 to the plan is a five-year compliance strategy that was developed in accordance with the *Guideline for Forest Industry Compliance Planning* (OMNR 1998a).

Regeneration monitoring was planned to be carried out on 73,000 ha, a level that is in approximate balance with the planned harvest areas.

The results of the 2000 IFA are provided in the plan. Progress on addressing the recommendation on a slash pile burning program was discussed. Further auditor

observations on Tembec's slash pile management program are included in section 3.4.2 of this report.

3.3.8 Plan Review and Approval

The audit team found that the 2000 FMP for the GCF was prepared, reviewed, and approved in accordance with the plan production schedule. The plan also met the planning requirements in effect, including the public consultation requirements, at the time it was approved.

3.3.9 Plan Amendments

A total of 26 amendments to the FMPs were processed over the term covered by the audit (2000-2005). All but three of the amendments were processed as administrative amendments. The number of amendments is within the norm for five-year plans. None of the amendment requests were considered frivolous in nature. A large proportion of these amendments accommodate changes for unforeseen events (e.g., adjustments to AOC prescriptions to account for new values or for values that were mapped incorrectly), adding new water crossings to accommodate salvage operations, changes to locations of previously planned water crossings based on new information, and correcting errors found in the FMP. None of the amendments compromised the objectives of the 2000 FMP. All of the amendments were appropriately documented, properly processed, and approved by the appropriate authorities.

Two amendments resulted in a change in harvest location to mitigate impacts on tourist operators. A formal issue resolution process was followed, and OMNR, Tembec and the tourist operator invested significant time and resources in resolving the concerns.

Documentation for the amendments is maintained at both the OMNR and Tembec offices, with OMNR maintaining a master list of the amendments and providing a copy of the master list to the Company. The master list provides a brief summary of each amendment, including when the amendment request was received by the OMNR, a brief description, and the approval date.

3.3.10 Contingency Plans

No contingency plan was required on this forest during the audit period.

3.3.11 Annual Work Schedules

AWSs were examined by the audit team and were found to contain all of the elements consistent with the requirements of the planning manuals in force at the time, and to be

consistent with the management plans under which they were prepared. The AWSs met public consultation requirements and were approved on time. The forest operations prescriptions (FOPs) included with the AWSs were prepared in accordance with the FMPM and were consistent with the SGRs.

3.4 Plan Implementation

3.4.1 Areas of Concern

The auditors examined 77 AOC prescriptions in the field, along with supporting documentation (air photos and compliance reports). These included water quality buffers, remote tourism and trapper's cabins, canoe routes, moose aquatic feedings areas, spawning areas, biodiversity reserves and park boundaries. In the field, all of the AOCs followed the FMP prescriptions.

Twenty-three water crossings, many associated with the above AOCs, were also examined for risk to the water resource. This included 11 bridges, four temporary bridges, five in-stream culverts, and three cross-drain culverts.

Overall, AOC prescriptions are appropriately assigned and well executed. Reserve boundaries are applied in the field using global positioning system (GPS), and we found them to be very precise. Occasionally in forest management, issues arise that had not previously been considered. One example of this is "grubbing," or creating small borrow pits to supply fill for road building. Grubbing within 100 m of water crossings is not permitted according to the *Environmental Guidelines for Access Roads and Water Crossings* (OMNR 1990), but can be allowed if it is specifically described in the FMP. During the term of the audit, discussion occurred about how to enforce this rule in areas that are very flat and, therefore, no risk exists. The Company and the OMNR arrived at a prescription that allows grubbing outside of the "zone of influence" of the watercourse. This means that as long as there is no slope to the water and it is not in the AOC, material can be used from the roadside. This was an acceptable action and it is formalized in the new plan. This is an example of a fairly mature relationship between the Company and the Government.

During interviews, the compliance process was extensively discussed. Compliance reporting was reviewed, especially considering the relatively few "not-in compliance" reports in the last year of the term of the audit. Based on our field examination, and the excellent documentation, it was clear that the Company was reporting on AOC and other wildlife requirements and adjusting for those requirements when necessary. The auditors found that the compliance reports provided ample description of the situation. It was determined that the steady reduction of "not-in-compliance" reports over the term of the audit is an outcome of: the maturing of the EMS; high quality and diligent training; the Company's response to the FSC certification requirements; and the developing experience of field staff in applying environmental guides.

Creating appropriate AOC prescriptions was a particular challenge to the planning team. Late in the planning process, there were still a number of outstanding issues related to AOCs or wildlife, including the osprey reserve amendment, the riparian prescription, and marten core areas. All of these were satisfactorily addressed, although the process was difficult. A recommendation is made in Section 3.3.1 of this report related to administration of the planning team. The following paragraphs address these in more detail.

In the 2005-2010 FMP, the requirements of the osprey prescriptions were altered, as per the new regional direction, and a monitoring plan was put in place. There were no exceptions related to wildlife guides in the 2000-2005 FMP. As a result of a cold, northern, relatively homogeneous forest, there are few Species at Risk (SAR), other than caribou, and therefore few exceptions to guides. The managers have produced a special report on "High Conservation Values" on the Forest, which describes their approach to the more challenging conservation issues including SAR.

Several interviewees commented on the new riparian prescription in the 2005-2010 FMP that no longer allows harvest near water. This prescription allows harvest up to the edge of riparian areas where the riparian areas are greater than 30 metres from the stream (Figure 2). Although this solves a number of issues, it was pointed out that some disturbance near water encourages beaver activity, or reduces loss of beaver from predation. Increases or decreases in beaver populations are a great source of discussion. Beavers are a natural part of the ecosystem and are particularly valued by the trapping community. The planning team could consider some modification of the prescription in high quality habitat, where trappers express an interest. We note that there is no overall risk to beaver populations from forest harvesting.

Suggestion 2: Given the importance of trapping on the Gordon Cosens Forest, and the importance of beaver to that activity, during the next planning cycle, the planning team should consider specific shoreline management prescriptions for beaver in suitable beaver habitat areas.

Regarding the marten core areas AOC prescription resolution, the planning team was able to arrive at the minimum requirement for core areas according to the marten guide, despite some significant wood supply challenges. OMNR approved the approach, although discussion was protracted.

From an environmental perspective, new water crossings are well designed and installation is well executed. The Company frequently uses temporary bridges, which is commendable. Although the environmental design is good on the new bridges, there are many old bridges still in use on the Forest. Maintenance of these has become a problem, as it is everywhere in the Province. The forest managers are working at becoming compliant with recent OMNR policy (*Protocol for the Review of Water Crossings Proposed Through the Forest Management Planning Process* [OMNR 2005b]) based on the report by the McComb committee on access administration. An inventory has been completed and responsibilities for roads and bridges have been discussed and are close to

Figure 2. An example of riparian area left around a small lake.

resolution. In practice, however, maintenance is still a problem. In our sample of water crossings, the auditors found a number of small problems: bridge decks in disrepair, gaps in decks, missing barber poles, damaged or missing guards. One bridge was signed as "unsafe", apparently for load restriction reasons. As well, despite cleaning efforts, this forest, with its fine soils, is prone to having bridge decks accumulate a great deal of material, which is at risk of being carried into watercourses. Material on the decks, in combination with some open decks or poorly maintained decks, makes for a clear risk. It is unlikely that a significantly stepped-up program of deck cleaning will reduce the risk. The Company has acknowledged the problem of open decks and has been working towards closing in the bridge decks. OMNR bears some responsibility because they have approved open decks in the past, but the Company has assumed responsibility. The auditors are basing the recommendation on that.

Recommendation 4: The Company should formalize their program for repairing and closing-in bridge deck surfaces on bridges that they are responsible for, and set a timetable for completion.

Although the audit team has commented above on the environmental aspects of bridge design, the engineering considerations are beyond the scope of this audit. The auditors did note that there is a significant lag time between submission of designs from the Company engineers and approval by the OMNR engineering group. There was some speculation that the reason for this is the particular design favoured by Tembec in

Kapuskasing. Regardless, it was noted that it was having an effect on the timing of road installation, which in turn was affecting the costs and efficiency of road construction. Bridge design is complex. The audit team was not able to determine whether there were issues related to incomplete plans, workload problems, or inadequate design tools. The delay warrants a recommendation and, based on our evidence, we have designated OMNR as the responsible agency, although it is quite possible the Company bears some responsibility.

Recommendation 5: OMNR should review their program for approval of bridge designs, to ensure they are provided in a timely manner.

3.4.2 Harvest

The audit team examined 78 areas harvested within the audit period. Approximately 75% of the timber harvested on the GCF was done under the supervision of Tembec-Kapuskasing, while the balance was harvested by five overlapping licensees (Excel Forest Products, Opasatika, Ontario; Lecours Lumber Company Limited, Calstock, Ontario; Tembec-Timmins, Timmins, Ontario; Tembec-Hearst, Hearst, Ontario; Synco Timber Limited, Val Rita, Ontario) and one third party operator (Columbia Forest Products, Hearst). Forest Resource Licenses are also issued to smaller independent contractors and individuals that harvest species such as tamarack, cedar and white birch for specialty lumber and fuelwood. These operators are allocated timber within current year allocated blocks following the harvest by Spruce Falls (Tembec) and the overlapping licensees.

The type of equipment used to harvest and move timber to roadside was primarily comprised of full-tree feller bunchers, grapple skidders that move the wood in full-tree form to roadside, and delimbers used to remove branches and treetops at roadside. Cut-to-length equipment had also been deployed in a few of the blocks that were visited. One small operator employs a feller-buncher and a forwarder to move logs out of the harvest block. Logs are sorted by product type and mill destination at roadside.

The physical nature of the sites on the GCF presents many operational challenges. Extensive lowland sites underlain with fine-textured and poorly drained soils cover much of the Forest. Special operating procedures are employed to reduce and mitigate site disturbance. These procedures include the use of high flotation tires on harvest and skidding equipment and directing operations to upland sites during the frost-free periods. Roughly two-thirds of the annual harvest operations take place during the winter season. Tembec maintains a large wood yard for storing wood to ensure a supply of raw material for its sawmill and pulp mill during the frost-free season.

Observations at all harvest locations visited by the audit team confirmed that utilization practices were generally good to excellent (Figure 3). While there were some instances of non-compliance found during our site visits, they appeared to be minor and isolated cases. Rutting was noted in three of the inspected blocks. One block observed by the

auditors had extensive rutting in the lowland areas. Compliance reports for this block determined that one inspection report noted that site disturbance had been detected in one small area. This block had been harvested entirely in the frost-free season (July to December, 2004). From our observations, it may have been preferable to harvest the lowland portions of this block during the winter season. Perhaps part of the reason for operating this block during the frost-free season was that the stand descriptions denoted nearly all of the conifer stands as being "upland".

Figure 3. An example of an efficiently harvested block is shown.

A joint local industry-OMNR committee ("Site Disturbance Sub-Committee") developed a guide in March 2003 to assist harvest supervisors and operators in minimizing site disturbance (*A Guide for Minimizing Site Disturbance and Site Damage on the Hearst Forest and the Gordon Cosens Forest, Draft* [Site Disturbance Sub-Committee 2003]). The guide has been continuously improved to the latest version of August 2005. This pro-active initiative is commendable and further refinements, as suggested in the guide, should be encouraged. Tembec has established a set of PSPs to monitor the effects of site disturbance and to gauge site recovery. The Company has produced standard operating procedures that provide guidance for preventing site disturbance. The Company also has a formalized work instruction (Boreal West Working Instruction No.007-Site Disturbance) that is distributed to supervisors and operators. This activity is consistent with operational efforts previously initiated on this forest (e.g. high flotation tires) that demonstrates a strong commitment to minimizing the environmental impacts of

operations on the wet soils of this forest. The consistent effort here is a best management practice.

Best Practice 2: Tembec and OMNR are commended for consistent efforts to develop effective wet soil operating techniques.

No pattern of non-compliance was apparent over the course of the audit. There was strong evidence in the field that all harvest blocks are flagged in advance of the operations, which has kept the number of trespasses relatively low. The compliance inspection program appears to be effective. Harvest blocks are normally inspected on the ground by certified inspectors and inspected by helicopter at least once a month. Harvest foremen map harvest progress monthly and submit their maps to the forestry office. Our site inspections verified that non-compliances detected by the compliance inspectors were reported and dealt with appropriately. With the few exceptions noted above, harvest operations were very well done and in compliance with applicable legislation and regulations. Operations were consistent with FOPs and were appropriate for the specific site conditions that were encountered. The foreman maps any changes from the original FOPs on the monthly progress maps, which is incorporated into the Geographic Information System (GIS) database. This process has worked well for the Company, based on the results observed.

All operators made exceptional efforts to protect streams previously unidentified in the forest inventory. The audit team found many examples where such streams had been flagged so that heavy equipment would avoid crossing them. Operators are instructed to stay at least 6 metres away from the newly identified streams.

Performance in terms of snag retention within the harvest areas was somewhat erratic, as the directions changed over the course of the five-year audit period. Part of this change was due to efforts made implementing the NDPE guidelines and part of the change was in response to Tembec's FSC audits.

Harvest sites were virtually spotless with very little industrial garbage being found.

Harvest areas observed in the field were properly recorded in the required tables and maps that accompany the Annual Reports. Comparisons of the Annual Report depletion maps and detailed harvest tables confirm that the depletion information is accurately recorded. Harvest operations were properly approved in the FMP (or FMP amendment) and applicable AWS. Cutting approvals, authorities to haul, and compliance monitoring reports were properly processed.

One item of concern that was noted and discussed during the site visits was the volume of logging slash (tops and branches) resulting from the harvesting process that was left at roadside and at landings (Figure 4). This material occupies land area that could otherwise be growing trees rather than sitting fallow. The larger piles of slash also represent a potential fire hazard. This condition was also a matter of concern during the previous audit and a recommendation, which included a specific target, was made to

address the situation. The Company informed the auditors that 7,477 ha of slash were burned during the audit term, which was 249% of planned levels. The increase in slash pile burning was in direct response to the findings and recommendations of the 2000 IFA. The audit team recognizes the Company's achievement. In the field, it was noted that Tembec has also piled up the slash in many blocks in order to partially recover productive land. These piles had not been burned, nor were there plans to do so in blocks where renewal activities had already been implemented. Tembec staff informed the auditors that they had intended to burn more slash piles, but were unable to do so, due to "changes in the OMNR requirements to conduct slash pile burning." The regulatory challenges stem from differences between the Company's and OMNR's interpretation of the policies that affect slash pile burning.

Figure 4. Slash disposal remains a significant operational challenge on the Gordon Cosens Forest.

The cost of complete slash pile removal using available technology within the current operating burning guidelines is excessive. Interviews with staff confirmed the cost of piling and burning approaches $1500.00 per recovered hectare. Company records indicated that 2.9% of the areas on lowland sites and 1.5% were on upland sites were covered with slash.

The auditors support the Company's attempts to recover this productive landbase. However, it is likely that refining current approaches to slash piling and burning will be more costly than beneficial. The Company and OMNR are encouraged to continue to seek alternative approaches to slash management that will use modified harvest

techniques to reduce the concentration of slash or to find commercial uses for slash that will reduce or eliminate the cost of landbase recovery.

Suggestion 3: The Company and OMNR are encouraged to seek alternative approaches to slash management that will use modified harvest techniques to reduce the concentration of slash or find commercial uses for slash that will reduce or eliminate the cost of landbase recovery.

3.4.3 Renewal

Over the five-year audit term (2000-2005), approximately 65,460 ha were regenerated, which represents 96% of the planned renewal program. The slight shortfall in target achievement is attributed to the higher than expected level of by-pass that was encountered in the harvest operations. It is evident that the Company's renewal program is slightly exceeding harvesting levels. During the audit term, 64,655 ha were depleted, while 65,460 ha were regenerated.

Spruce-dominated lowlands lend themselves well to natural forms of regeneration (Figure 5). Suitable seedbeds or advanced regeneration are prevalent on many of these sites. Tembec's renewal program takes full advantage of natural renewal, with approximately two-thirds of the program comprised of natural forms of treatment. These treatments include harvesting to protect advanced regeneration and leaving group seed trees. Implementation of the NDPE guide and FSC residual canopy requirements has left most areas harvested under the clearcut silvicultural system with an abundance of residual forest. To ensure the success of these treatments, Tembec and its overlapping licensees employ techniques during the harvesting phase (e.g., using wide high-floatation tires) to assist in reducing site disturbance, which in turn provides increased protection to available seedbed. The success of this formula was readily apparent during the site visits.

The balance of the renewal program involves artificial treatments, consisting primarily of planting and seeding. Mechanical site preparation may precede the artificial renewal treatments, depending on the need to create suitable planting microsites. Shear blading is the type of mechanical site preparation method usually employed, and is normally undertaken in the spring while the ground is still frozen. Conducting mechanical site preparation in the spring allows for treating sites that would otherwise be inaccessible and helps reduce site disturbance. Lighter forms of mechanical site preparation (e.g., disc trencher) may be used on upland sites. Chemical site preparation is employed on highly productive sites to control unwanted vegetative competition. Company staff noted that they are reducing their use of mechanical site preparation and using chemical site preparation more frequently compared to past usage. Field staff have discovered that chemical site preparation is effective in reducing woody competition without the unwanted side-effects of site disturbance, which can result from mechanical treatments. Slash pile burning was conducted on 7,477 ha during the audit term. No prescribed burning other than the slash pile burning was conducted over the audit period.

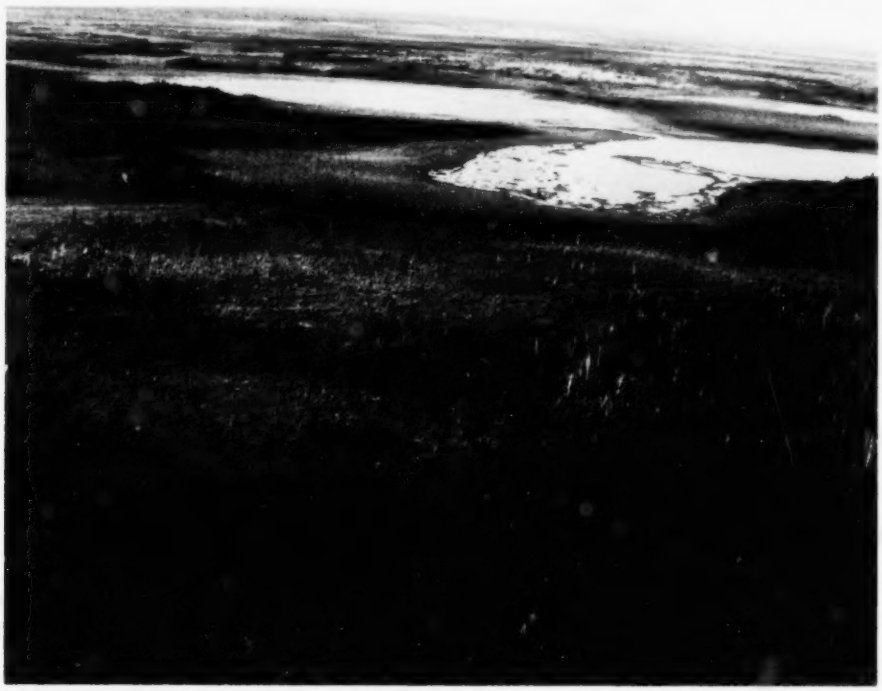

Figure 5. An example of regeneration on lowland spruce areas.

One site preparation and one renewal project were funded through the Forestry Futures Trust Fund. This project (# 4032R13) consisted of treating a wildfire area with mechanical site preparation (corridoring) in 2001, followed by planting 630,000 jack pine, black spruce and white spruce trees in 2002.

The audit team observed numerous examples of silviculture treatment packages at various stages of implementation. Typically, renewal occurs within one or two years following the harvest. Within one to five years following artificial treatment and eight to eleven years following natural renewal, treatment areas are inspected to assess their status and determine if further treatment is required. Such inspections are often conducted aerially, and occasionally on the ground. Ground assessments involve establishing one metre radius plots and recording crop tree health and competition level. This data forms the basis for decision-making or recommendations in subsequent AWSs, where areas may be earmarked for additional treatment (e.g., tending, fill-in planting) or FTG assessment.

In general, the audit team witnessed a very effective renewal program, where sites were treated promptly and with appropriate prescriptions.

Conformity to the SGRs was apparent and the treatments being applied appear to be effective on the renewal sites that were visited. The prescribed practices for each site and

the desired future forest unit were suitable, consistent with the FOPs, and should maintain forest productivity.

Compliance inspections of the renewal program indicate there is general conformance to the AWS and other applicable legislation. Two incidences that were reported over the audit period were both minor in nature. One involved planting outside of the area approved in the AWS, while the other involved failing to remove a temporary access bridge after tree planting.

Over the audit term, 62,375 ha of renewal areas and barren and scattered (B&S) stands were surveyed for regeneration success, which represents 93% of the planned level of 73,096 ha. Out of the area surveyed, 62,504 ha were found to be successfully regenerated, which translates into a success rate of 92%. Most of the areas deemed "unsuccessful" required tending treatments or additional height growth before they could be considered FTG. Our field visits, coupled with our examination of the documentation, confirmed that the boundaries of the sampled field locations had been properly mapped and accurately recorded in the Company's reporting system. The audit team's observations in the field supported the Company's claims of free-growing status and agreed with the new stand descriptors in nearly all cases. Performance was consistent in all aspects of the FTG program. In only one instance did the auditors note where the stand description did not match the data provided to the audit team and, in that case, tree height was actually taller in the field compared to value shown on the map. In implementing their FTG program, the Company has been attempting to reduce the extent of B&S areas in their inventory. B&S stands that are in proximity of FTG survey areas are assessed to determine if they can be entered into the inventory as productive forest stands.

All FTG assessments are initially conducted using ocular surveys by helicopter. Stand descriptions that are observed during the flight are written on the maps. These maps are turned over to the GIS department, where both spatial and tabular attributes are transferred to the forestry database. For areas that are not deemed FTG, reasons are noted (e.g., needs more time to grow or brush competition needs to be controlled) and the area is scheduled to be re-examined in future years. Should uncertainties arise in establishing whether or not a stand meets the FTG criteria, then a low-flyover or a landing will be done to examine the stand more closely. Formal ground assessments, however, are not conducted. OMNR has never requested copies of stand descriptions. OMNR staff have occasionally accompanied Company staff during the FTG flights.

3.4.4 Tending and Protection

Tending activities occurred on 34,284 ha over the audit term, which included 33,964 ha of aerial herbicide application, 111 ha of ground herbicide application, and 209 ha of spacing. The Company's aerial tending program was not completed in 2003 and 2004, due to unsuitable weather, resulting in a shortfall (72%) compared to planned levels. It should be noted that due to a successful program in 2005, all backlog areas were treated.

Vision (glyphosate) is the herbicide most widely applied on the Forest. On sites that had primarily alder competition, 2,4-D was used. Spacing was conducted in plantations using brushsaws to reduce stem densities.

In the field, the audit team observed numerous examples where tending treatments had been implemented. Within two to five years following artificial treatment and eight to 11 years following natural renewal, renewal treatment areas are inspected to assess their status and determine if further follow-up treatment is required. Such inspections are often conducted aerially, and occasionally on the ground. Ground assessments involve establishing 50 m^2 plots and recording crop tree health and competition level. Assessments appear to have been carried out conscientiously, as areas designated for tending treatments were in need of treatment.

The normal application of herbicides to control alder competition on lowland spruce sites eight to 10 years after harvest is clearly effective. These sites regenerate naturally, and eight to 10 years allows for the new crop of trees to establish to the point where they can benefit from a release treatment.

The impact of the problems encountered with the 2003 and 2004 aerial tending programs was evident at some of the field stops where crop trees were exhibiting signs of stress and weakness due to overtopping competition. Some stock losses may have occurred, however, they appeared to have been minimal at the time of observation. The Company will be monitoring these areas to determine if re-treatment is necessary.

In general, the audit team witnessed an effective tending program, where efforts are made to apply tending treatments promptly, discriminately, and with appropriate prescriptions. The implementation of electronic navigation as a standard tool on the GCF during the five-year term has had a positive effect on the discriminate use and, in some cases, reduced use of herbicides.

Conformity to the SGRs was apparent and the treatments being applied appear to be effective on the tending treatment sites that were visited. The prescribed tending for each site and the desired future forest unit were suitable, consistent with the FOPs, and should maintain forest productivity. Areas slated for treatment were approved in the FMP and appropriate AWS, or in the amendments. Treatment areas are being accurately mapped, tracked, and reported in the required Annual Reports.

Compliance inspections of the maintenance program indicate there is general conformance to the AWS and other applicable legislation. The nine non-compliance incidences that were reported involved oversprays, which were relatively inconsequential in their impact and were all reported to the Ministry of the Environment (MOE).

No protection treatments against insects or diseases were carried out during the audit period, although one was considered during a forest tent caterpillar outbreak. Forest tent caterpillar is a cyclical pest of poplar trees and, under normal circumstances, causes some

growth loss in poplar but little mortality. This outbreak caused relatively high levels of poplar mortality across several forests in the Northeast Region.

3.4.5 Renewal Support

Tembec has annually conducted or coordinated activities such as cone collection and planting stock production in support of the renewal program. Documentation indicates that seed inventories and stock production programs are adequate to support the current and projected renewal program on the Forest.

Up to the end of the 2003-2004 season, Tembec had collected over 242 hectolitres (hl) of cones, primarily comprised of white spruce (116 hl), black spruce (98 hl), jack pine (26 hl) and white pine (2 hl). The Company has exceeded their planned cone collection target. Over the same period, 182 million seeds (black and white spruce) were dispersed in the aerial seeding program. Tembec has also exceeded their stock production targets during the audit term (36.3 million trees), with over 43.2 million container stock being planted over the five-year period.

In 2005, under the umbrella of the Northeast Seed Management Association (NESMA), "improved stock" was out-planted within areas that the Company has established for an intensive forest management research project (NEBIE - Natural disturbance, Extensive, Basic, Intensive, and Elite). Additionally, improved black spruce stock is scheduled for planting during the spring of 2006. The stock is "improved" in that it has originated from seed collected from a first generation seed orchard.

It should be noted that the 2000-2005 FMP text mentions very little about the Company's involvement in any tree improvement programs. There is no reference to seed orchard plans or tree improvement strategies in the FMP text. Through interviews with Company staff, it became apparent that Tembec is highly involved in a number of tree improvement activities that take place at the Edward Bonner Tree Improvement Centre. Through information provided by staff, it was learned that Tembec is one of nine partner companies that help fund a considerable amount of tree improvement work under the auspices of the Forest Research Partnership and NESMA (of which Tembec is a member). NESMA is a not-for-profit, incorporated organization comprised of nine forest companies and one government partner (OMNR). The forest company partners cover the operational costs, while the government partner provides in-kind scientific and technical support. The organization has three full-time staff members and several seasonal workers. The Association's purpose is to satisfy the forest company partners' need for tree seedling planting stock in Northeastern Ontario by providing black spruce and jack pine tree seed, genetically improved through natural breeding and selection.

Most of the tree improvement work associated with the GCF takes place at the Bonner Tree Improvement Centre, which is located within the GCF near Moonbeam, Ontario. The centre is situated on private land that is owned by the Ontario Realty Corporation, thus, the activities taking place there are not subject to an FMP. There are two black

spruce (first generation and second generation) seed orchards maintained at the Bonner Tree Improvement Centre.

It was obvious from the evidence examined by the auditors that NESMA and the Forest Research Partnership are spending significant funds and conducting a considerable amount of research in tree improvement. Unfortunately, Tembec has not explained their involvement in this valuable work in their FMP, which is a missed opportunity for the industry to confirm their contribution toward this research and development effort.

Suggestion 4: Tembec should consider strengthening the renewal support text in the forest management plan to illustrate how the Company is making valuable contributions to the tree improvement program.

3.4.6 Access

Since 1928, Tembec has managed all or parts of the timber limits that form the present-day GCF, with the purpose of supplying timber to its sawmills and paper mills. Consequently, there is a well-developed access infrastructure. The road construction program for the five-year audit period is still considered aggressive, with a planned level of 553 km of primary and secondary road construction.

The scarcity of suitable aggregate resources in the Great Northern Clay Belt poses operational difficulties and results in high costs in constructing and maintaining access on much of the GCF (Figure 6). Lack of gravel for access road construction limits the amount of all-weather road that can be built and maintained. During road construction, the predominance of organic sites often necessitates laying down brush mats covered with clay and gravel. This type of construction is commonly used to access most sites on the GCF. Although the license area is well accessed, during the frost-free season, very few roads are usable for hauling timber with conventional truck hauling technology. This situation places major constraints on wood delivery, which is principally limited to frozen ground on significant portions of the management unit.

The high potential for sedimentation presents a formidable operational challenge when constructing water crossings. Operators must exercise extra vigilance and care to ensure that fine silts and clays do not enter water bodies. For permanent crossings, the Company and the overlapping licensees perform the required hydrology calculations and submit detailed bridge designs and plans to OMNR for approval. The plans include engineering and site details, operating plans, sediment control plans, watershed calculations, monitoring and maintenance details, and removal and rehabilitation procedures.

Temporary structures are frequently used for crossing streams. Engineered portable bridges, temporary log or square timber bridges, small culverts and snow and ice bridges are all used for transient crossings. A set of template designs for the bridges is included with the AWS.

Figure 6. Clay soils and a lack of aggregate lead to difficulties in building and maintaining primary roads. A heavy rain created this rut, making the road effectively impassable.

All temporary water crossings are designed to adhere to the *Environmental Guidelines for Access Roads and Water Crossings* (OMNR 1990) and the *Code of Practice for Timber Management Operations within Riparian Areas* (OMNR 1998b). When culverts are used, TN-013 (*CSP Culvert Installation at Water Crossings on Forest Access Roads* [Wilson 1994]) is followed. When unmapped stream courses or previously unknown intermittent streams are encountered during road construction, a water crossing key is consulted to determine if the location is a water crossing or cross-drainage. When deemed to be a water crossing, the Company will construct an appropriate structure. Any temporary bridge with a span greater than three metres is submitted for approval to the OMNR's Regional Engineer, as per the *Report on Crown Land Bridge Management* (OFIA/OLMA/MNR Bridge Standards Committee/MNR Provincial Bridge Management Committee 1989), prior to being installed.

For crossings that are to be left in place during the spring run-off, hydrology calculations are done to ensure that the opening size is adequate for the expected flows during the time that the crossing is to remain in place. Crossings that do not meet the expected flows are removed prior to the spring run-off.

The audit team travelled on all primary and most active secondary roads during the field audit and was satisfied that construction practices were generally good. Roads are, by-

and-large, well maintained, with minor problems noted at a few water crossings. At least 23 water crossings were examined in the field. Issues observed at water crossings included bridge decks in disrepair, gaps in decks, missing "tiger tail" warning posts, and damaged or missing guards. One bridge was signed as "unsafe", apparently for load restriction reasons. As well, bridge decks on this forest, with its fine soils, are prone to accumulating a great deal of soil material, which is at risk of being carried into watercourses in large amounts. Despite cleaning efforts by the Company, material was found on some open bridge decks and was washing into watercourses. A recommendation dealing with this issue is made in Section 3.4.1 of this report. Removals of temporary crossing structures were conducted in excellent fashion and the associated rehabilitation work has yielded outstanding results.

There were 11 non-compliances reported over the audit period dealing with access. Issues with water crossings (sedimentation, crossing failure, lack of maintenance, unacceptable construction practices) were the primary reasons for the non-compliances. In September 2002, Tembec was charged for improper installation of a culvert, which led to siltation of a stream and harmful alteration and disruption to fish habitat. Tembec's performance in relation to water crossings has demonstrated considerable improvement recently, with only one non-compliance related to access being reported over the past two years.

Selected road locations were compared against those in the FMP. In all cases, roads were located within approved corridors and locations, as prescribed.

3.5 Systems Support

3.5.1 Human Resources

The two criteria related to human resources focus on awareness and training of employees. Staffs of both the Company and the OMNR know their employment responsibilities. Both have well developed policies covering the required elements of sustainable forest management and, over the last decade, they have become part of the culture of each. The Company's commitment to the FSC certification and its EMS has meant that field staff have been well briefed on regulations and legal responsibilities, sustainable forest management policies, objectives, and plans. Every employee is aware of this commitment and has the appropriate training modules assigned. Professional staff also have access to special training as needed.

To ensure that Company policies are carried out to the fullest extent possible, a contract management procedure (FRO-F-446.01 v1) outlines the requirements for contractors carrying out forestry, harvesting and construction operations. The procedure clearly identifies that all contracts will include reference to Forever Green®, the Ontario Forest Industries Code of Practice and the Company's ISO 14001 EMS. It stipulates training and administration responsibilities for contractors. It is practical in allowing the Company

to retain control of certain environmental and safety responsibilities if the contractor is not able to address them.

Outreach to operators is a key element of the Tembec program. They communicate important parts of the EMS through field visits and when opportunity allows. They have plans for a sophisticated key card system outlining the EMS requirements. This is pending the maturing of the EMS after the recent transition to an all-Ontario version of the EMS system.

OMNR is responsible for ensuring that their complex policy framework is transferred to a wide audience, including practitioners. They have in place routine training programs for planning teams, compliance officers, and others to communicate this information. Professional training is available. One local OMNR staff member is on the provincial Compliance Training Committee.

Tembec manages the distribution of its corporate polices and procedures through its registered ISO 14000 EMS. The auditors reviewed the training and monitoring records of the EMS. Interviews confirmed the program has been delivered to contractors and is being implemented effectively.

The auditors reviewed the records of select employees for completeness. No problems were found. The reporting and tracking system for training is effective. Records show that staff are receiving a wide range of training and no gaps were identified.

Both OMNR and Tembec keep training records. Contractors working for Tembec keep their own records for operators but, because the records are within of the scope of the Tembec EMS, they fall within the external audits conducted for that system.

3.5.2 Documentation and Quality Control

Tembec document control is centralized through their EMS, which is ISO registered. The auditors reviewed a number of components of their information system including compliance, silvicultural records summaries, training records and materials, and work instructions. There were no gaps or errors found. The Company has a modern, well-maintained GIS system that is well administered, routinely backed up and used for all field forest management activities. The system is accessible to operational staff.

Documentation was thoroughly checked in the field, where the Company was required to put together a package of 105 field sites with all of the accompanying silvicultural projects and compliance reporting. There were no significant errors in this extensive review, as corroborated in the field examination of 101 of these sites. We reviewed the procedures with staff for backup and archiving. The information was complete and stored in a practical, accessible format.

The Company has available a very valuable set of 1947 high resolution aerial photographs of the Forest. Although the immediate uses for this information are limited, its value as documentation of the pre-fire control Forest is clear. The Company has safeguarded these in a concrete storage area. Although another copy exists, a digital copy of this information would provide better protection for this important information. The Company is encouraged to seek funding to accomplish this task.

Suggestion 5: The Company should seek outside funding for protecting and digitizing the valuable 1947 aerial photography of the Forest.

Tembec is meeting the requirements of the FMPM and FIM. For example, Annual Report information is being submitted by the Company through the "FIM Portal" by the due dates and the products being submitted conform to the FIM requirements (e.g., spatial and tabular data). FMP documentation and maps appear to be in order and meeting the technical requirements. AWS and Annual Report maps also meet the FIM requirements in terms of content and scales. Mapped data was understandable and unambiguous. With few exceptions, maps were excellent for reading and often included reference key maps of the management unit, which facilitated quick orientation for the reader.

Tembec closely tracks the change in sustainability indicators on the GCF by updating their forest inventory as required by the FIM. The basic FRI is used to generate the data needed to track the sustainability indicators (e.g., landscape pattern indices, frequency distribution of clearcut and disturbance sizes, forest diversity indices, managed Crown forest available for timber production, habitat area for selected wildlife species). The most recent update to the FRI occurred during preparation of the 2005 FMP. Tembec faced several challenges when updating the FRI in preparation for the 2005 FMP, with a number of concerns stemming from the need to amalgamate two inventories (the GCF inventory and the former Kapuskasing CMU inventory). During this exercise, all known depletions resulting from harvest, fire and insect infestation were updated to reflect their actual status as of 2001-2002. FTG data collected up to the end of the 2002-2003 activity year was incorporated into the update. Depletions and accruals that were expected to occur up to March 31, 2005 were also incorporated into the update. During the FRI updating process, Tembec developed a process to automate the removal of "sliver" stands and incorporate them into adjacent stands. Using the automation process, 18,700 slivers were removed.

According to records provided, OMNR provided Tembec with the base feature components of the planning inventory on April 2, 2003, which was later than the suggested deadline date in FIM. Tembec delivered the GCF final planning inventory to OMNR on August 25, 2005. As per Part B-Section 5.3.4.1 of FIM, the auditors determined that the SFL Holder submitted the composite planning inventory product to OMNR on July 30, 2003. This delivery is late (it was due by the Invitation to Participate stage - January 15, 2003), but, as noted above, OMNR did not deliver the base feature components until April 2003. The delivery of Management Decision Information was difficult to verify due to the nature of the information, which includes several

components that are not usually completed at the same time (e.g., forest unit definitions, silviculture intensity, etc.) The delivery of other planning inventory components that are due by the draft plan submission date (July 9, 2004, in this case, when the draft FMP was submitted) could not be substantiated by OMNR since much of the draft plan information had not been archived nor was documentation available specifically verifying that the required inventory products had been delivered as required.

The auditor's review of inventory delivery and meeting the FIM requirements found that it was difficult to ascertain if OMNR had actually verified the planning inventory products for accuracy and completeness (no documentation available) or if OMNR had notified Tembec that the planning inventory information that was delivered was acceptable and within the timeframes outlined in Section 5.3.3 of FIM. Clear direction is lacking as to which OMNR staff are responsible for verifying the planning inventory and acknowledging its acceptability, and what format is to be used for notification within the timeframes specified in FIM.

Recommendation 6: Corporate OMNR shall develop specifications that more clearly define staff responsibilities for meeting the planning inventory verification requirements outlined in Section 5.3.3 of the Forest Information Manual. The specifications should include a format for documenting the acceptance and notification process.

Tembec maintains an active operations monitoring program via a number of tools and methods such as ground and aerial reconnaissance, aerial photography, satellite imagery, and GPS technology. The suite of activities for recording and documenting is referred to as the "Forestry Services Data Collection and Assessment Program." The inventory maintenance, PSP measurements, cruising, tire rutting assessments, and volume sampling are examples of the programs that are covered under this umbrella. The audit team examined the plethora of documentation that is maintained to substantiate the information found in the Company databases (e.g., the field FTG maps illustrating the ocular estimates made during aerial assessment flights and the progress maps from the harvest foreman depicting the status of operations in the field). Staff were able to retrieve the information efficiently when required.

Tembec and its personnel are continuously seeking out improved techniques and technologies to increase productivity in data collection and maintaining high quality data standards. Aside from GIS and GPS technologies, Tembec has explored and/or implemented a number of emerging/existing technologies for use in their forest management program, such as new remote sensing devices, electronic data collectors, laser range-finder equipment, and radio transponder height devices. Most recently, the Company started using radar technology (LIDAR), originally designed for military applications, to create a new inventory for the GCF. Although the GCF inventory has not yet been updated, small areas of the Forest have been used to test the new inventory. Unsolicited support from field staff was enthusiastic.

3.6 Monitoring

3.6.1 General Monitoring

Hearst District has prepared a District Compliance Strategy that covers the five-year period from 2002-2007. The strategy provides guidance for implementing the compliance monitoring program on all aspects of natural resource management, protection, and maintenance that falls under the jurisdiction of OMNR. The Strategy broadly describes the District's natural resources base that is to be monitored, including significant features related to compliance. There is a major section devoted to "compliance issues" categorized by the various programs administered by OMNR (e.g., fisheries, wildlife, forests, lands, fire, aggregates, and parks). This section is followed by a section that lists the District compliance priorities, objectives, and options, identified in seven priority areas. The priorities, objectives, and options listed in this document form the basis for developing the Annual Implementation Schedule within the Annual Compliance Operating Plan (ACOP).

The auditors found that Hearst District did not prepare the required ACOPs during the audit period. However, an ACOP was prepared for the 2005-2006 annual period, which was examined. The ACOP lists the compliance promotion, resource monitoring, and enforcement activities scheduled to be undertaken by the District over the year. The overall goal of the ACOP is to minimize the rate of non-compliance with the resource-related legislation in the Hearst District. Planned compliance activities for monitoring the Forest's program included conducting random harvest inspections (including joint inspections with industry personnel), conducting random inspections of the renewal and maintenance operations, conducting water crossing inspections, facilitating meetings between District and industry measurement staff, conducting audits of mills, conducting compliance meetings, reviewing AWSs, entering compliance reports into the compliance database, and making inspection reports available to the public. Oddly, there were essentially no quantitative targets specified in the ACOP. Only a general commitment is made to conduct compliance inspections at a level that is proportional to the level of non-compliance and past performance.

The absence of quantitative compliance monitoring targets makes it difficult to assess whether or not the District is implementing its program according to its plan. Evidence gathered through the audit team's inspection of field sites and compliance reports suggests that the level of monitoring is suitable, considering the degree of non-compliance that is detected or reported on the GCF. District staff conduct verification inspections of Tembec compliance inspections, inspections of water crossing construction activities, and spot checks for adherence to forest fire prevention regulations. District compliance staff report that Tembec conducts an effective compliance monitoring program and is diligent in filing their reports.

Tembec prepared a five-year Compliance Plan covering the 2000-2005 period, which was approved by the OMNR Hearst District Manager on March 30, 2000. The five-year plan

met all of the requirements outlined under the OMNR's *Guideline for Forest Industry Compliance Planning* (OMNR 1998a). The plan includes a detailed discussion of unique features found on the GCF and a comprehensive section dealing with the problems, issues, and challenges related to various aspects of the forest operations. The Company has developed procedures for addressing issues that have surfaced from previous compliance inspections. For example, there is a decision key for trespass reporting and another decision key to assist staff in determining if an encountered water drainage way should be treated as a "water crossing" or as "cross drainage".

Tembec has also prepared an Annual Plan of Action for each of the five years within the scope of the audit (2000-2005). The first two sections of the annual plan are similar in content to the five-year plan. The third section provides the substance for the annual schedule of compliance activities. This section also contains an analysis of the previous year's compliance program results and a trend analysis. Suggestions for improving the compliance program and reducing the number of non-compliances are presented in the text. A protocol for monitoring, inspecting, and reporting is described and is supplemented with a tentative schedule of operations, which incorporates Tembec's operations and those of the overlapping licensees. Criteria for inspection data reporting are listed as well.

A sampling of cut approvals demonstrated that issuance dates did not precede the date of approval of the compliance monitoring plans.

Tembec is responsible for the overall monitoring program on the GCF. All overlapping licensees are responsible for compliance monitoring on their own operations and submitting their reports to OMNR, with copies being given to Tembec. As outlined in the *Guideline for Forest Industry Compliance Planning* (OMNR 2005c), overlapping licensees can no longer submit inspection reports directly to OMNR unless they have been approved to do so. Tembec has not requested such approval. The audit team is impressed with the effectiveness of the program as it is currently managed, and suggests that Tembec request a delegation from OMNR so that the overlapping licensees can continue to submit reports directly to OMNR.

Suggestion 6: The Company should request a delegation from OMNR under the Guideline for Forest Industry Compliance Planning, January 2005, so that the overlapping licensees can continue to submit compliance reports directly to OMNR.

OMNR conducts verification inspections of the submitted reports and spot check inspections in fulfillment of their monitoring responsibilities. Evidence of the monitoring that has taken place over the five-year audit period is substantiated by the copies of inspections reports filed under the Provincially-sanctioned Forest Operations Inspection Program (FOIP). Tembec and OMNR both used the FOIP software for reporting compliance monitoring inspections for access, harvest, renewal, and protection operations. All reporting is documented in a digital format, which allows for quick access and retrieval. Reporting by Tembec and the overlapping licensees is completed in a timely fashion and procedures outlined in the compliance plans are being followed.

Maps and photographs accompany many reports and reference and location information is complete and accurate.

A review of OMNR's inspection reports confirmed that the OMNR is actively monitoring and auditing forest operations and comparing their compliance findings with those conducted by the Company and its overlapping licensees. Since both organizations make extensive use of GPS technology, inspection sites can be conveniently located. Non-compliances are being reported within the prescribed timeframes. Sufficient information is being provided by the Company to allow OMNR to make a determination on the extent and significance of non-compliances, when they occur. Communication between the two organizations is good.

A total of 1,065 compliance inspections were completed during the audit period, 936 by Tembec and the overlapping licensees and 129 by OMNR. Tables 1 and 2 provide details regarding the compliance reporting. Out of the 936 Company-filed reports, a total of 49 incidents of non-compliance occurred over the audit period. OMNR's statistics show that only 22 incidents of non-compliance occurred over the same period. The disparity between the two sets of numbers is attributed to having numerous Company-reported non-compliances being resolved in the field, without any further need for punitive action. Of the 22 non-compliance incidents investigated by OMNR, 16 were categorized as "minor", four were "moderate", and two were considered "significant". Sixteen of the non-compliance incidents were initially reported by the Company, while six were discovered by OMNR inspectors. Instances of non-compliance generally involve harvesting infractions, such as wasteful practices and cutting into AOCs, and access infractions related to improper water crossing installations. Three penalties were assessed by OMNR under the CFSA and one penalty was assessed by MOE under the Ontario Water Resources Act (R.S.O. 1990, c. 0.40). Two warnings were issued under the Federal Fisheries Act (R.S.C. 1985, c. F-14) by the Department of Fisheries and Oceans (DFO). The MOE penalty, one of the OMNR penalties and the DFO warning were for the same incident. It was noted that there has been a downward trend in the number of reported non-compliances over the 2000-2005 term. Based on the Company statistics, there has been a marked reduction in the frequency rate of non-compliance reports compared to the rate observed in the previous independent audit report, dropping from 16% to 5%. This accomplishment is very commendable and reflects Tembec's stated goal of eventually eliminating all non-compliances.

No pattern of non-compliance was apparent over the course of our visits to the selected field sites. There was strong evidence in the field that precautions are taken to prevent or reduce the number of non-compliances. For example, all harvest blocks are flagged in advance of operations, which has kept the number of trespasses relatively low (especially when considering the magnitude of operations on this forest). At least once a month, harvest blocks are normally inspected on the ground, by certified inspectors, and by helicopter. Operations foremen are picked up by helicopter along with staff from the forestry department for the aerial fly-over inspections. In some cases, equipment operators are also given the opportunity to view their "workmanship" from above. Harvest foremen will map harvesting progress monthly and submit their maps to the

Table 1. Compliance inspection summaries for the Gordon Cosens Forest.

SFL & Overlapping Licensees Compliance Inspections 2000-2005				OMNR Compliance Inspections 2000-2005			
Activity Inspected	Total Number of Reports	In compliance	Non-compliance	Activity Inspected	Total Number of Reports	In compliance	Non-compliance
Access	322	311	11	Access	44	38	6
Harvest	533	506	27	Harvest	79	65	14
Renewal	33	31	2	Renewal	3	1	2
Maintenance	47	38	9	Maintenance			0
Protection	1	1	0	Protection	3	3	0
TOTALS	936	887	49	TOTALS	129	107	22

Table 2. Summary of non-compliance findings on the Gordon Cosens Forest.

	Level of Significance				Action Taken			
Activity Inspected	Minor	Moderate	Significant	Total	Ongoing	Resolved	Warning	Penalty
Access	4	2		6		6		
Harvest	10	2	2	14	1	9		3
Renewal	2			2		2		
Maintenance								
Protection								
TOTALS	16	4	2	22	1	17		3*

* One of the penalties involved two non-compliance instances.

forestry office. Tembec's forest resources management staff normally conducts the formal Forest Operations Inspections on a monthly schedule and are responsible for reporting any non-compliances immediately to the OMNR. Forest resources management staff are also responsible for administering the remedial action and training plans as required. On the harvest operations, camp foremen conduct informal inspections on a daily basis.

In terms of staff numbers, Tembec has six individuals who are certified compliance inspectors and carry out these functions as regular aspects of their job duties. OMNR Hearst (Kapuskasing Area) has four individuals on staff that are certified inspectors, but only one individual performs this function regularly. OMNR appears to have been able to maintain its presence and an adequate level of spot-checking of operations on the GCF. However, considering the size of the GCF and the magnitude of operations, the auditors question if one individual is capable of maintaining this level of oversight. Having another staff member familiar with the status of compliance program would be beneficial as a "back-up," and we understand that OMNR is currently addressing this issue.

For the non-compliances that were recorded, the actions taken in response to their discovery were proper and reasonable. Penalties were imposed when appropriate. In other cases, the responsible party remedied the situation soon after the infraction was discovered. Tembec has a company-wide procedure, as part of their EMS, dealing with all non-conformances that occur under its operations, including non-compliances that are detected under the forest management compliance monitoring program. The procedure identifies root causes for the non-conformance and establishes a system of positive encouragement and follow-up, with the purpose of working toward continual improvement and prevention of non-compliance.

Judging from the examination of the evidence, the observations during the field visits, review of the compliance reports, and interviews with industry and OMNR staff, the auditors conclude that the compliance monitoring program on the GCF is effective, very well implemented overall, and in compliance with all applicable legislation and regulations.

As part of the implementation of the plan, measurable indicators of forest sustainability must be monitored to provide for the assessment of forest sustainability to be included in the Report of Past Forest Operations (RPFO). The auditors were able to review the two RPFOs covering 1985 to 1995. The RPFO for the 2000-2005 FMP was not yet available. We focused on the indicators discussion and development in the FMP text for the 2000-2005 plan, and briefly reviewed the development of the indicators for the current plan.

The RPFOs cover an early period in the transition to a more ecosystem based approach, and a limited number of indicators were tracked. Their content is reviewed more fully in Section 3.6.3 of this report. The reports on forestry activities include harvest, utilization, renewal, tending, protection, regeneration success, and roads. The development of the broader sustainability indicators occurred after this period, and the RPFO that reports on them will be audited in the next IFA. This is unfortunate timing for this audit because,

after a protracted development of indicators, the new RPFO will be the first opportunity to evaluate the actual on-the-ground "foot print" of forestry using landscape indicators. However, the building of a series RPFOs documents, even with a limited scope, is a useful accomplishment. The auditors found the RPFOs to be credible and useful documents.

Wildlife indicators are a challenge on some forests because they are sensitive to age class distribution of the forest cover. This means it is a real challenge for managers to keep wildlife habitat supply in the target range of 19 species throughout the term. In the 2000 FMP, the SFMM model forecast that all of the wildlife would be within range for the first 40 years. Input was altered to bring the wildlife indicators into an acceptable range, or at least to optimize them across the entire planning horizon for the 2000-2005 FMP. The planning team did a good job of addressing all of the key indicators. The range of nine alternatives ensured a robust comparison was made of each indicator.

The auditors noted that for the 2000-2005 FMP, the indicators were used to select the management alternative by weighting them across 17 planning terms, effectively 170 years. This may have been the group decision of the planning team, however, it does appear to place half of the weighting on a time period that is more than a lifetime away. In the current FMP, 15 terms were used. Normally, all of the reporting in the FMP is focussed on a much more practical time frame (e.g. the year 2020 for the current FMP), and a scoring system that reflects this would be more supportable.

Suggestion 7: The planning team should consider using a scoring system for selecting the management alternative that is less weighted to far future indicator values.

The development of indicators for the current plan, 2005-2010, as described in the current FMP, was limited by "... a number of factors, including lack of knowledge about how forest vegetation manipulation affects other possible indicators (e.g., forest-based recreational opportunities)." This challenge was confirmed in interviews, but the planning team was confident that the numbers used were the best possible. The information available was up to standard for the Province.

The 2005-2010 FMP builds on the indicator work that was done in the two previous plans. It may be expected that this should be the case, but the author's frequent reference to previous plans and slight shifts from one plan to the next is very helpful, and is a good practice. One example, from a long list of reported indicators, is the important and closely scrutinized "disturbance polygon" size. The author reports in the current plan that there is a significant difference between the actual number of polygons less than 260 ha in size and the Natural Disturbance Template. This is attributed to the scale of analysis, past application of the moose guidelines, the amalgamation of the highly fragmented Kapuskasing CMU with the GCF in the year 2000, and the application of the harvest block requirements of the NDPE guide. This is an accurate and accessible interpretation of a key indicator, which does not cover up the problem. This is typical of the level of analysis of indicators in both FMPs.

Silvicultural effectiveness is monitored by assessing a regenerating forest to determine if it is meeting regeneration standards. Assessments are conducted to determine the status of the forest stand condition, the effectiveness of silviculture treatments, and the courses of remedial action, should a particular area not be satisfactorily regenerated.

Based on the FMP, stands are given an initial prescription that is verified by field supervisors. Recommendations are made for specifics of the silvicultural treatment by supervisors on a month-by-month basis, including container stock or seeding. The AWS is based on these recommendations and verified by the area foresters based on field visits during AWS preparation. On sites that are planted, "quality plots" are placed to verify several characteristics of the operation. Data collectors are used and daily reviews are performed to identify problems. In addition, "forest regeneration sample plots" that follow OMNR guides are placed, particularly in areas where there may be challenges. These locations are recorded on GPS, trees are pinned and survival surveys are completed for revisiting later. Competitive upland sites are visited one year later to check for survival, tending needs or stand remediation needs.

The FTG assessment in year eleven after depletion is the fail-safe way to ensure adequate stocking and checking standards. Methods are in accordance with the *Free-Growing Regeneration Assessment Manual for Ontario, Draft* (OMNR Undated). The results and summaries of the surveys are recorded on the GIS.

The Company maintains FTG spatial and database information in the GIS that is updated annually. The Trend Analysis reported for the five-year term that 62,375 ha were harvested in the 1990-1995 period and were eligible for FTG status in this term. Of this total, 58,728 ha were reported successfully regenerated and 3,477 ha were not surveyed. Only 170 ha were classified as B&S (99.7% success). Field visits of FTG sites conducted by the auditors confirmed that the FTG assessment results were accurate.

OMNR District staff is initiating a more detailed assessment of silvicultural effectiveness. The project collects and examines five data layers, namely planned and actual harvest areas, chemical site preparation, mechanical site preparation and regeneration method. The results indicate a strong relationship between planned versus actual harvest areas, but a weaker relationship between planned and actual silvicultural activities. This work is not yet complete, but it does point to a strategic approach to assessing the effectiveness of silviculture on the Forest.

Several interviewees on the audit suggested a similar level of monitoring should be occurring to monitor the effectiveness of other guidelines in meeting their environmental objectives. New guidance to forest managers frequently results in increased operating cost, either in the form of reduced wood supply or additional operational restrictions. It seems sensible and useful to recommend that OMNR maintain a monitoring program to ensure that guidelines such as the NDPE guidelines are effective in meeting their stated environmental objectives, and that both costs and benefits of guidelines be operationally documented.

Recommendation 7: OMNR should establish and maintain environmental guideline monitoring programs to ensure guidelines effectively and efficiently meet their stated objectives.

3.6.2 Annual Report

The Annual Reports were submitted on time, are well organized and are consistently of good quality. Some room for improvement is noted. Maps that accompany the Annual Reports are produced digitally and neatly laid out. Each map includes a key map enabling the reader to orient him/herself readily. In some cases, the map legends were cryptic where acronyms had been used, and no interpretation was provided on the map itself or in the Annual Report text.

Explanations for any significant deviations between the AWS forecasts and the actual levels of activity are provided and are reasonable, but tend to be brief. For example, in the 2000-2001 Spring Report (Part 1), there are no reasons offered under the Forest Operations Inspections section explaining why the non-compliances occurred over the reporting year. The text here could have been more detailed and provided examples of the non-compliances. In addition, some description of the "procedures to address the non-compliances" could have been provided in the text or a reference indicating where the procedures could be found would have been helpful. Another example of where additional text would have been helpful is in the 2000-2001 Part 2 Annual Report, where the lower than expected volumes were attributed to higher levels of by-pass, but no reason is provided for the excessive by-pass.

The Annual Reports provide discussion on the levels of achievement versus the planned levels forecasted in the AWSs. Discussion around progress toward achieving FMP targets appear to be confined to harvesting in the Part 2 reports. Comparisons of the actual cumulative harvest area and volume levels completed to date versus the planned FMP targets are presented in tabular format. However, the quality of the Annual Report text would have been enhanced if comparisons toward all FMP targets for all activities, where possible, were included in the text. Although some trend analysis is provided in broad terms in relation to accomplishments versus FMP harvest targets, the discussion is brief.

Suggestion 8: The Annual Reports should contain more descriptive text explaining reasons for deviations for all aspects of forest operations, analysis on progress toward achieving forest management plan targets (where possible), and more detailed discussion around emerging trends.

Some inconsistencies were noted. For example, in the 2002-2003 Annual Report, large areas of blowdown are cited as contributing toward the level of unplanned by-pass encountered, yet there is no blow down recorded as depletions in Tables AR-1 or AR-4. Another inconsistency involves the recording of treatments in Table AR-6 *(Annual Report of Renewal, Tending, and Protection Operations)*, where the Company has elected

to record treated areas by the pre-harvest forest unit, rather than the future forest unit. The Company's practice is contrary to the requirements of the FMPM. The Company's rationale for recording in this fashion is that the "future forest unit cannot truly be assigned to these treated areas until free-to-grow has been achieved". Despite this inconsistency, however, the auditors have noted that reporting by future forest unit is no longer a requirement in the comparable Annual Report table under the 2004 FMPM (OMNR 2004).

Tembec complied with the changing reporting formats of the Annual Reports through the audit period. The format of the 2000-2001 to 2003-2004 Annual Reports conformed to the requirements of the 1996 FMPM, and the information reported in the tables appears to be consistent with the objectives of the FMPs. Tables, maps, and spatial coverages appear to be submitted in the formats required by FIM.

Starting with the 2002-2003 Annual Report (Part 2) and the 2003-2004 Annual Report (Part 1), Tembec has been submitting the Annual Reports through the FIM Portal. This is a web-based submission site where all FIM-related information products are delivered to OMNR in electronic format, including all maps. The portal records the date of the submissions and provides room for the submitters and the reviewers to type in comments. The portal also sends out a notification email to the Company and OMNR personnel when products are delivered to the portal. Approval status is also provided.

Prior to the establishment of the FIM Portal, it was noted that OMNR's Head Office issued direction to its staff in September 2000 (revised to Version 2 in November 2002) listing a protocol for reviewing the Annual Reports, which includes deadlines (review deadlines had not been specified in the original FMPM). The protocol included a checklist that the OMNR staff reviewer was required to complete, showing the date the Annual Report was received and the date that the review was completed. A review of these check sheets at the OMNR District office revealed that the checklist had been completed in some cases, but were only partially completed in others.

In the summer of 2005, OMNR released new direction, reflecting the changes embodied in the 2004 FMPM, regarding the review of Annual Reports, which will apply to the 2004-2005 Annual Reports. Under the new process, the OMNR District must review the Annual Reports at specified milestones, but has the option of accepting the Annual Report "as is" in other reporting years.

The 2004-2005 Annual Report is being prepared in accordance with the new 2004 FMPM, and is no longer broken up into two parts. The 2004-2005 Annual Report is not required for submission until November 15, 2005.

Each Annual Report contains summaries of negotiations with native communities, as per the requirements.

Audit results were not discussed in any of the Annual Reports, contrary to the requirements of the 1996 FMPM. The Company and OMNR did complete the audit action plan in a fully acceptable manner.

Recommendation 8: The Company should ensure that future Annual Reports prepared for the Gordon Cosens Forest comply with the requirements of the Forest Management Planning Manual. Specifically, the text should include a summary of action items prepared in response to Independent Forest Audits.

3.6.3 Report of Past Forest Operations

The RPFO, which is prepared by the Company, is an assessment of the success of the past FMPs. The report is developed by compiling information from the Annual Reports from a plan's term and comparing planned levels of operations with actual achievements. As part of this process, plan objectives and management strategies are assessed.

The auditors examined the 1990-1995 RPFO and the 1995-2000 Draft RPFO for the GCF and the 1989-1994 RPFO for the Kapuskasing CMU.

The 1990-1995 GCF RPFO contains all of the tables required under the transitional provisions in the FMPM (e.g., RPFO-1, 3, 4, 6, 7, 8 and 10), as stated in the FMPM requirements (Appendix VIII, Section 2.3.3). Table RPFO-14 and RPFO-19, which are expected to be completed if the information is available, have not been provided. The text of the RPFO implies that much of the data needed to complete the two tables was not available.

Table 6 was not applicable for the Kapuskasing CMU RPFO. Other tables have been completed as noted in the paragraph above.

The 1995-2000 GCF RPFO contains all of the tables required under the transitional provisions in the FMPM (e.g., RPFO-1, 3, 4, 6, 7, 8,10, 14 and 19), as stated in the FMPM requirements (Appendix VIII, Section 2.3.3).

The text of the 1990-1995 GCF RPFO offers comparisons between planned and actual levels of operations, however, the comparisons tend to be at a summary level with little detail provided. The extent of comparisons varies considerably by subject area. A number of issues are described in the text, but in many cases, they are not explicitly tied to the achievement levels. The reader is left to surmise that the presented issues contributed to the deviations. Discussion around emerging issues is provided in parts of the report text. For example, there is a good discussion about the high level of by-pass recorded in Table RPFO-1 (Summary Report of Depletion Area), followed by text describing possible remedial measures that could be taken to address this problem. For those subject areas where explanations for the deviations from planned levels were provided, the explanations are reasonable.

These discussions are more thorough in the 1995-2000 GCF RPFO. Differences between planned and actual operations were most significant in terms of harvest by-pass and assessment of FTG status of the new forest. By-pass describes a planned harvest operation that could not be completed because the volume found on site was insufficient to support commercial harvest. In some cases, the trees on site have not grown enough to be harvested, and in these situations, the sites will be eligible for harvest once commercial volumes have accrued. In other cases, stand damage due to, for example, blow down or insect infestation has made the areas inoperable. A total of 8.7% of the harvest areas was projected to be by-pass while 17% (19,885 hectares) was actually by-passed.

The Company planned to complete 60, 720 hectares of FTG assessment during the 1995-2000 period and actually completed 199, 390, with 158, 543 hectares meeting FTG standards. The RPFO does not elaborate on the reasons for this overachievement.

Planned versus actual harvest volumes were close on both the basis of species (98% softwood and 92% hardwood) and delivered volume to individual mills. Renewal efforts were completed on 98% of the area planned.

The RPFO for the Kapuskasing CMU discussed the large differences between planned and actual operations. Thirty-four percent of the planned conifer harvest area and 18% of the hardwood area was actually harvested. The Kapuskasing CMU was harvested after contractors had completed harvest obligations on other areas (private land and the Gordon Cosens Forest Management Area [FMA]) and much of the harvest area on the Kapuskasing CMU was lower quality. The RPFO concludes that the impact of under harvesting is insignificant, as most of the area is lowland spruce that will be available for future harvest.

The assessment of forest sustainability section is brief in the 1990-1995 GCF RPFO. Tembec has met the requirements of the 1996 FMP phase-in requirements. As noted in Appendix VIII of the 1996 FMPM (page APP 50, Sec 2.3.1), the requirements for the RPFO "...cannot be fully met until plans scheduled for renewal commencing April 1, 2008." Therefore, forest sustainability can only be assessed using the best information available that describes changes in forest condition over the five-year term. Additional analysis could have been provided here, demonstrating the Company's outstanding performance in renewing the Forest and returning depleted areas to productive forests. The section dealing with achievement of management objectives is also weak. For example, there is no assessment or discussion on the achievement of non-timber objectives. It would have been beneficial if the text listed each objective from the 1990 Timber Management Plan (TMP), followed by an assessment of achievement and discussion.

There is not an explicit discussion assessing sustainability in the Kapuskasing CMU RPFO. There are comments on emerging requirements to do so.

The assessment of sustainability in the 1995-2000 GCF RPFO has met the phase in requirements of the 1996 FMPM. The discussion includes comment on the reduction of area available for timber production during the 2000-2005 planning period due to the designation of protected area as part of OLL (46,656 hectares), and comment on the size and distribution of clearcuts and wildfires, noting the planned versus actual were relatively close. The RPFO goes on to provide a concise assessment of achievement of each of five management objectives.

Neither the 1990-1995 GCF nor the Kapuskasing CMU RPFO provide a "list" of amendments to the FMP. Both describe the amendments that were approved during the 1990-1995 or 1989-1994 periods, presumably because the lists are rather short. According to the text, there were seven amendments processed during the five-year term on the GCF (two major, one minor, and four administrative) and one minor amendment on the Kapuskasing CMU.

Amendments are discussed in the 1995-2000 GCF RPFO. Thirty-four amendments were undertaken, of which three were major amendments, 10 were minor amendments and the remainder administrative amendments.

The number of amendment requests is reasonable, given the magnitude of operations on the forests. The rationale provided for requesting the amendments and the amendment classifications all appear to be appropriate for the circumstances.

There is evidence demonstrating that the Company considered the conclusions of the RPFOs in preparing the 2000 FMP. On page 50 of the 2000 FMP text, it is noted that the strategic direction in the plan "summarizes the problems, issues and opportunities that have evolved from past plans, the RPFO, and independent audits and other sources that were considered in setting the strategic direction for this forest management plan." Indeed, some of the issues noted in the RPFO recommendations appear in the Issues section of the 2000 FMP. In another example, the issue of road use and maintenance was one of the aspects addressed in the Integrated Resource Management Strategies developed for the 2000 FMP. In one other example, promoting the utilization of white birch and other under-utilized species was pursued as a qualitative target in the 2000 FMP.

A Summary of Report of Past Forest Operations was prepared that meets the requirements of the 1996 FMPM. The report highlights the evaluation of operations, the achievement of management objectives, and the conclusions and recommendations from the RPFO, and it summarizes the results of the 1995 IFA. In all aspects, the summary is consistent with the RPFO.

3.7 Achievement of Management Objectives and Forest Sustainability

The success of forest management activities must be assessed in terms of meeting the objectives they were designed to achieve. By comparing planned activities with actual

levels of achievement, it is possible to judge the success of the management plan in terms of satisfying its objectives. Forest sustainability is the overriding objective of the CFSA. Where available, specific indicators of sustainability can be used to assess forest sustainability against the objectives of the CFSA. By reviewing planning documents and comparing those to reports and examining trend data provided by OMNR and the Company, the auditors can attempt to make a judgment on the sustainability of the Forest.

3.7.1 Achievement of Management Objectives

The CFSA provides direction on management objectives that must be included in every FMP. The criteria under which objectives are grouped are:

1) Conservation of forest diversity;
2) Maintenance and enhancement of forest ecosystem condition and productivity;
3) Conservation of soil and water resources;
4) Forest ecosystem contributions to global ecological cycles;
5) Multiple benefits to society; and
6) Accepting society's responsibility for sustainable development.

These criteria set the strategic direction for forest management on the GCF throughout this audit period and provide a useful framework to assess the Company's progress in meeting obligations for sustainable forest management.

Assessing management objectives is best done when the land base is stable and the stated objectives are consistent throughout the evaluation period. The land base on this unit has been changed inside this audit period. First, the Kapuskasing CMU and GCF were amalgamated, functionally with the writing of the 2000-2020 FMP and formally with the signing Gordon Cosens SFL document in 2001. The land base was further changed following a land exchange. The land exchange transferred some of Tembec's former freehold land along the Missinabi River to the Crown, allowing the Government to expand its park property along that river. In return, Tembec received three townships in the south central portion of the GCF as freehold land.

The 1990-1995 RPFO for the pre-amalgamation GCF, the 1989-1994 RPFO for the Kapuskasing CMU, and the 1995-2000 RPFO for the GCF support the 2000-2020 FMP for the GCF.

The 1990-1995 RPFO for the GCF summarizes operations carried out from 1990-1995. The report includes a brief assessment of forest sustainability. It also provides a brief comment on performance in achieving two management objectives.

The harvest objective was met "through harvesting stands of composition and age class in the TMP, through offering of timber which was surplus to the needs of Spruce Falls to other local industry, and through sawlog-chip exchanges which maximizes the value derived from the timber."

The renewal objective was "to ensure that a perpetual supply of timber was available to the mill in Kapuskasing". The RPFO states that the objective was met by conducting renewal treatments on a greater proportion of sites than was planned.

The RPFO for the Kapuskasing CMU summarized operations from 1989-1994. This report does not specifically assess forest sustainability. It does contain assessments on performance measures that can be assumed to be management objectives.

Timber harvest on the Kapuskasing CMU utilized 47% of the conifer allocation and 50% of the hardwood allocation. The impact of the conifer under harvest was found to be insignificant, as black spruce "stores" well on clay sites without losing appreciable volume. Hardwood underutilization was noted as a more significant event, as natural volume loss in mature stands is rapid.

Forest renewal targets were not met. Thirteen percent of the natural regeneration targets, 76% of the planned seeding targets, 58% of the planned planting, 37% of the planned site preparation and 57% of the planned tending targets were achieved. The shortfall in achieving targets was explained by a number of factors, including lack of harvesting, supplementing planned natural regeneration with seeding and lack of funding.

Forest regeneration assessment exceeded planned levels by 189%. There was a significant backlog of unassessed lands that had been tracked in the inventory as B&S areas. A significant effort to survey those lands along with planned survey areas added 17,291 ha into the productive forest.

The 1995-2000 RPFO for the GCF includes a more detailed assessment of sustainability. Evidence is provided assessing accomplishments in achieving each of five management objectives. Harvest objectives have been met by supplying predictable supplies of timber to wood consuming industry. Ninety-eight percent of planned softwood and 92% of planned hardwood volumes were harvested.

Renewal targets are effectively met, as 98% of the planned areas were treated. The Forest Biodiversity objective has been addressed through the implementation of the biodiversity strategy. The auditors witnessed a difference in operating practices that demonstrated the performance of this strategy on the ground, adding credibility to the statements in the RPFO.

Environmental quality and integrated resource management objectives are discussed briefly in the 1995-2000 GCF RPFO. The report references Tembec's ISO 14001 procedures that pertain to the Forest. The audit team reviewed these. The use of high flotation tires, frozen ground operating procedures and the Company's quick response to road washouts all supported the RPFO claims to success in meeting these objectives.

The progress in meeting these objectives was evident based on these three RPFOs and validated by direct field observation. The RPFOs provide progressive context as part of the genesis of the management objectives as they are addressed in the 2000 FMP, Annual

Reports from the audit period and in the Comparison and Trend Analysis of Planned versus Actual Forest Operations for the GCF (Appendix A).

The 2000-2020 and 2005-2025 FMPs and the Trend Analysis Objectives provide descriptions of objectives. For the purpose of this report, the objectives have been grouped by the criteria used in the determination of forest sustainability in the CFSA.

Criteria: Conservation of forest diversity

Objectives:

From the 2000-2020 FMP: To maintain the biological diversity of the Gordon Cosens Forest.

Related objectives:

- Forest landscape objective: The long-term nature of the forest landscape precludes them from being changed from plan to plan, otherwise they become meaningless.
- Forest type objective: To maintain all major boreal forest types that are currently found on the landscape.
- Age class structure objective: To maintain overall forest age class in a manner similar to a fire origin forest.
- Harvest disturbance patch size objective: To maintain a range of harvest disturbance patch sizes across the landscape that mimics the frequency distribution of disturbance patch size created by natural disturbance.
- Harvest patch separation objectives: To ensure that harvest disturbance patches are spatially separated in a manner similar to disturbance patterns in the fire origin forest.
- Leave areas objectives: To ensure that harvest patches will contain leave areas that mimic the unburnt portions within a natural wildfire in terms of size, number, shape, forest composition orientation and connectivity.
- Structural elements objective: To ensure that representative post disturbance structural elements are left as a result of harvesting.
- Marten core area objective: To maintain marten habitat at an acceptable level.
- Selected featured species objective: To maintain habitat for selected featured species within the bounds of natural variation.
- Rare, threatened, vulnerable and endangered species objective: To protect rare, threatened, vulnerable and endangered species found on the Gordon Cosens Forest.

Discussion: The Company created a biodiversity strategy for the Forest in 1994. The 2000 FMP lists three measurable indicators (landscape pattern indices, frequency distribution of clearcut and wildfire sizes and forest diversity indices). The Company has biological records on the Forest dating to the 1940s that provide a better than normal factual base for landscape and biodiversity assessments. A detailed assessment of HCVFs was written is support of the FSC certification effort. The report identifies five

high conservation values areas and effectively meets and exceeds requirements of the FMPM.

Age class structure is being monitored through continual inventory updates. Harvest layout is being managed by considering harvest patch size, leave area size, shape and connectedness, and by having specific standards for residual structure on cut areas.

Field observations confirmed a fundamental change in harvest operations that have occurred over the last 15 years. Current stand layout and harvest techniques are leaving much more residual material.

The HCVF report documents species, habitat, and types and locations of areas needing special management consideration. The report identifies four species that are of special concern or listed as threatened and provides an assessment of their management options. Identified HCVFs include white and red pine stands, which are at the edge of their natural habitat range, Lake Sturgeon, which is considered to be regionally rare, lands protected under the OLL program and large landscape level forests.

It is apparent that the Company is working in a comprehensive manner to meet the intent of the objectives the auditors have grouped under the conservation of biological diversity criterion.

Criteria: Maintenance and enhancement of forest ecosystem condition and productivity

Objectives:

From the 2000-2020 FMP: The silvicultural goal is to ensure natural or artificial regeneration of all harvested and naturally depleted areas to achieve the desired future forest condition.

Related objectives:

- To employ cost effective renewal and tending treatments that will provide perpetual and continuous flow of quality fibre from the Gordon Cosens Forest.
- To maintain or enhance future timber yields by intensively managing selected highly productive sites.
- To contribute to the improvement of overall forest health.

Discussion: The Company is meeting regeneration targets. The auditors conducted direct inspections on 87 sites to verify the regeneration effort. The sites included planted, seeded and naturally regenerated areas. The sample spanned activity from newly established plantings to sites that were declared FTG some 11-15 years post harvest. This field inspection confirmed a successful forest regeneration program.

Table 7 of the Trend Analysis confirms that the Company is on target with regenerating the Forest. Of the 62,375 ha that were depleted between 1990 and 1995, 58,728 ha have

been surveyed and declared FTG. Of the remaining area, 3,477 ha were not surveyed, but will be in the next planning period, and 170 ha did not meet FTG standards.

It is more difficult to assess progress against the intensive forest management objective. Most of the regeneration effort appears to be largely the same as it has been for the last decade. Lowland sites are regenerated naturally, with tending required near year nine. Upland sites are planted and tended in most situations. The auditors did not see sites that were being treated more intensively.

To counter that, the audit team did review, as reported in Section 3.4.5 of this report, work the Company is doing in tree improvement and the work facilitated by Tembec's initiation and continued management of the Forestry Research Partnership. This is clear evidence that the Company is investing in new science and technology.

The forest health objective was addressed by implementing a specific strategy to harvest a portion of the forest stands that were depleted by spruce budworm during the mid to late 1970s and early 1980s. A portion of this second growth balsam fir has been harvested during the current term. Planting white and black spruce together and encouraging mixed wood management on these sites should make subsequent stands less vulnerable to budworm defoliation.

Concern caused by forest tent caterpillar and poplar decline on the GCF during the 2000-2005 five-year planning term precipitated the formation of a regional committee to address the issue. No treatment was conducted. Poplar decline and forest tent caterpillar areas were tracked by OMNR during the 2000-2005 term. The issue is under continued study.

Criteria: Conservation of soil and water resources

Objectives:

From the 2000-2020 FMP:

- Environmental quality objective: To conduct timber management activities in a manner which minimizes and mitigates the impacts on environmental quality.
- Water quality objective: To minimize the impacts on water quality and aquatic habitat within areas of harvest, renewal, tending and access operations.
- Quality fisheries zone objective: To maintain the integrity and remote character of the quality fisheries zones located in the Chapleau district.

Discussion: The Company has a series of operational procedures intended to protect soils and water quality. These are part of the ISO 14001 EMS. Harvest schedules were developed based on consideration of site information and current science. Harvest operations utilized the most appropriate machinery to minimize impact on environmental quality. The Company was the first in Ontario to use high flotation equipment

operationally. Frozen ground restrictions are entrenched in operations. The Company helped create *A Guide for Minimizing Site Disturbance and Site Damage on the Hearst Forest and the Gordon Cosens Forest* (Site Disturbance Sub-Committee 2003), which contains practical operational advice.

The audit team visited two sites that demonstrated the Company's commitment to these objectives. Construction of the Griffin Road extension caused significant deposition of silt into streams. The audit team reviewed both the compliance response and the corrective actions taken. Inspection of the site shows the road has been stabilized and the stream that was affected is currently running clear. Much of this correction can be attributed to the significant resources spent. The beavers that created the natural downstream sediment trap have assisted as well. The Company and OMNR have diligently monitored recovery.

A second site was immediately adjacent to Swanson Road. Severe rutting occurred on a lowland site during a late spring harvest in 2001. The Company did not stop this operation in time to prevent this damage. Reaction included establishing a formal assessment to monitor recovery and supplementing natural regeneration prescriptions with planting. Four years later the rutting is still evident, but recovery is clearly underway. The new crop is well established and the site is productive.

Achievement of this objective is monitored through Tembec's forest compliance inspection program. Technological improvements in bridge and culvert installations are implemented to ensure that impact on the water quality is minimized.

The audit team concludes that the objectives supporting this criterion are being met.

Criteria: Forest ecosystem contributions to global ecological cycles

There are no objectives that, in the opinion of the audit team, directly address this criterion. This is not surprising, as the science supporting this criterion is still in the developmental stage. The Company explains its approach to this criterion in the 2005-2025 FMP. That section of the report is quoted here: "Global ecological cycles are a complex of self-regulating processes responsible for recycling the earth's limited supply of water, carbon, nitrogen and other life-sustaining elements. The world's forests are critically dependent upon, and make substantial contribution to, these global processes.

There is growing evidence that environmental changes (i.e. forest fires, logging, conversion to agricultural land, development, etc.) may cause elevated atmospheric carbon dioxide (CO_2). The potential effects of CO_2 on global climate will alter forest ecosystems in Ontario over the long run. Increased CO_2, drought and temperature will affect the growth and survival of plants by altering their physiological behaviour. Differing migration rates and reactions of individual species to new environmental conditions could result in new plant species mixes for which we currently lack management experience.

These negative impacts could, in the future, be addressed locally through adaptive management techniques such as:

- Thinning to reduce moisture stress;
- Early harvesting of stands deteriorating due to stress, followed by planting of more climatically adapted species; and
- Tree breeding aimed at increasing pest and stress tolerance."

This is a reasonable explanation of the current position. The auditors would expect that the Company's operational response to implementing its proposed management changes will become evident as the problems themselves are more clearly defined. In the interim, the Company's position is acceptable.

Criteria: Multiple benefits to society

Objectives:

From the 2000-2020 FMP: To provide for an optimum continuous flow of social and economic benefits from the Gordon Cosens Forest.

Related objectives:

- Harvest objective 1: To provide a continuous and predictable supply of wood resources, at a minimum cost to Spruce Falls now and in perpetuity.
- Harvest objective 2: To provide for a predictable supply of wood fibre, surplus to Spruce Fall's requirements, to other forest processing facilities.
- Harvest objective 3: To provide the public and local entrepreneurs with opportunities to harvest fuel wood and other forest (wood fibre) resources.

Discussion: These objectives are being met. Wood supply will be reduced by approximately 13% in the next 30-year period. That is a smaller gap than is being predicted in other forests in Northeastern Ontario. The audit team interviewed most third party license holders on the Forest. Not all parties are obtaining their full volume commitment, but all are relatively satisfied that wood is flowing from this unit in a manner that fairly reflects operational limits. The economic opportunities created from timber harvest on the GCF are being realized.

The 2000-2020 FMP states that the selected management alternative provides the most stable wood supply while meeting the obligations of environmental protection and, therefore, provides the most stable employment opportunities of alternatives assessed. The social and economic impacts calculated using the SEIM model supported this assessment.

Needs of other users are implicitly addressed through the long-term provision of forested habitat in the 2000 FMP. The 2005 FMP has more detailed objectives that address needs of other forest users. The objectives state support for creating opportunities for local

entrepreneurs to harvest firewood, maintaining opportunities for the local trapping industry, maintaining opportunities for resource based tourism operators and managing forest access in a manner that balances the needs of road and road-less based forest users. These objectives will be assessed at the end of the 2005 planning period. Based on interviews, the audit team concludes that the Company is addressing all of these objectives in their planning and operations.

Criteria: Accepting society's responsibility for sustainable development

Objectives:

From the 2000-2020 FMP:

- To protect all known cultural and heritage values on the Gordon Cosens Forest.
- Integrated resource management objective: To minimize any negative effects that forest management may have on other forest users and use.

The audit team draws again from the 2005-2025 FMP to capture the Company's approach to this criterion. "The concept of sustainable development transcends biological, ecological, and economic benchmarks. Ultimately it is about people. It is about society's values, the quality of life of members of society both individually and collectively, and the 'effectiveness with which we have organized ourselves and our resources in the best interests of present and future generations.' Thus, this criterion concerns the effectiveness of institutions in managing resources in ways that accurately reflect social values and the responsiveness of institutions to change as values change. It also looks at how we deal with special and unique needs of particular cultural and/or socio-economic communities, and the extent to which the allocation of our scarce resources can be considered to be fair, equitable, balanced, and just."

OMNR has diligently collected known cultural and heritage values on the GCF. The Company applies this information to guide operations effectively. In Section 3.2.3 of this report, the auditors have noted an opportunity to improve this effort through dialogue with Moose Cree First Nation.

The audit team concludes that the Company and OMNR are meeting the intent of this criterion.

There are issues regarding other users of the forest estate. These are a matter of common activity and discussion among the stakeholders, OMNR and the Company staff. Complete agreement among stakeholders on what defines minimal impact of forestry on other users is probably not an achievable goal. Both OMNR and the Company have demonstrated intent to continue to address a long-term strategy of accommodating multiple users on the public forest.

3.7.2 Review of RPFO Assessment of Sustainability

The 1990-1995 RPFO for the GCF summarizes operations carried out from 1990-1995. The report includes a brief assessment of forest sustainability. It also provides a brief comment on performance in achieving two management objectives.

The RPFO for the Kapuskasing CMU summarized operations from 1989-1994. This report does not specifically assess forest sustainability. It does contain assessments on performance measures that can be assumed to be management objectives.

The 1995-2000 GCF RPFO does contain an assessment of sustainability that meets the requirements of the FMP.

Tabular information provided in all three reports, as detailed in Section 3.6.3 of this report, confirm that the authors of the RPFOs did conduct the quantitative analysis that will provide a basis for assessing sustainability in future efforts. Shortfalls in achievement levels for harvest and renewal are explained briefly.

3.7.3 Review of Comparison and Trend Analysis of Planned vs. Actual Forest Operations

As part of the requirements for the IFA process, the Company has collated information from the previous two and the current planning periods (1990-2005 inclusive) for the GCF, in order to provide trends information on forest sustainability. The Trend Analysis report submitted by the Company was received in good order and provided reasons and rationale for trends. The auditors used this report during the sustainability analysis, as well as the Annual Reports produced during the audit term. The figures used in all of the Trend Analysis tables have been annualized to facilitate more meaningful comparisons.

The long-term size and composition of the forest defines the ability of forest managers to address ecosystem changes. The larger the forest management unit, the more opportunity there is to implement activities that result in large scale changes to the environment.

The GCF increased its geographical boundaries over the 15-year period considered. The total forested land increased by 13.5% (1,530,484 ha in 1990 to 1,737,616 ha in 2005). The change in landbase was the result of a combination of the amalgamation of the former Kapuskasing CMU into the GCF in 2000 and withdrawals and exchanges as part of the OLL initiative.

Changes in forest composition in terms of tree species occurred at the end of the 15-year period compared to the beginning. For example, the area classified as jack pine was reduced by 12%, the area classified as spruce was increased by 6%, and poplar remained about the same. Table 1 in the Trend Analysis shows changes in land base for the Forest.

Changes in the managed productive forest are driven by the change in the geographical boundaries as well as silvicultural and ecological events. The origin of the present mature and over-mature forest has evolved from several large, unmanaged forest fires that occurred in 1850, 1895, 1905 and 1923. The influence of fire has been increasingly reduced since 1940, as fire suppression technology has improved. The origin of the new productive forest, that is to say the forest composed of stands less than 60 years old, is heavily influenced by management activities. Management efficiencies of the 1950s and 1960s led to large clearcuts. Implementing moose guidelines from the late 1970s to the mid 1990s created more fragmented harvest patterns. Current direction to emulate natural disturbance patterns will drive the harvest patterns and the subsequent new forest to imitate the interpreted "natural" patterns caused by fire and other natural disturbance.

Insect infestations (primarily spruce budworm) were a major cause of change on the Forest. In particular, a severe spruce budworm infestation during the mid- to late 1970s and early 1980s resulted in a significant loss of conifer, and in particular, balsam fir throughout the Forest.

It was evident throughout the Trend Analysis and in the audit team's review of other evidence that Tembec has effectively adjusted to these changes in management direction. The current Company effort to incorporate the NDPE guide was initiated by direction from the FSC certification in 2002. The result is an impressive change in activity. Sites inspected that were harvested 11-15 years ago have impressive spruce stands growing back, but have little residual conifer and an incidental level of hardwood. Sites that had been harvested over the last five-year period have substantially more residual trees of all species and more hardwood. The direction to increase fragmentation, the number of mature residual trees, and the structural diversity in harvest blocks has been implemented.

The conclusion of the auditors is that the Company and OMNR have demonstrated a clear capacity to manage this forest ecosystem as directed.

In more operational terms, the Trend Analysis concisely and accurately describes the forest units, planned and actual harvest volumes and areas, and renewal activities.

Forest units describe how forest stands are categorized for management purposes. Table 2 in the Trend Analysis describes the forest units that were used for the 1990-1995, 1995-2000, and 2000-2005 five-year planning terms. The forest units that were developed for the 2000-2005 five-year planning term are similar to those employed in previous plans on this forest. The number of forest units was increased from six in the 1995-2015 FMP to eight during the 2000-2020 FMP, in order to subdivide the upland forest unit into a more practical operational group. These new forest units also tied in closely with the forest units that were being used in adjacent forests, including the former Kapuskasing CMU.

Planned versus actual harvest volumes is detailed for each of the three planning terms. Conifer volume was 89% of that planned for the 1990-1995 term, essentially 100% for

the 1995-2000 term and 86% for the 2000-2005 term. Hardwood volumes harvested were 78%, 52% and 51% for the same time periods.

The area harvested on the Forest has been less than planned for each of the three planning periods since 1990. Fifty-six percent of the planned areas were harvested in 1990-1995, 83% in 1995-2000 and over 90% in the 2000-2005 period. These figures are taken from Table 4 in the Trend Analysis.

Ideally, the percent of planned forest area harvested and the percent planned volume harvested should be very similar. An accurate inventory will track the volume available by species, age class and size for each stand in the forest and a record of areas harvested should closely relate to the volume harvested. Errors in forest inventory confound expectations. Classic forest inventory may be inaccurate in terms of volume estimate by as much as 30% on an individual stand basis. This tends to balance out over the course of a five-year period and the extent of a forest estate.

The trend of areas and volume harvested are similar on this forest. Overall, the percent planned volume harvested is slightly higher than the percent area harvested. The initial observation would be that the inventory overestimates volume per hectare. Given that there is consistently less area harvested than planned on this forest, it is reasonable to conclude that the remaining areas are available for future harvest.

However, the harvest operations are influenced by more than just the predicted area and volume found to be available. Markets for timber species change both tactically and strategically. If markets do not support profitable extraction of timber from sites that are difficult to access or have poor quality, the areas will be by-passed. The need for profitable operations necessarily creates a bias towards harvesting the high volume areas that are close to the mill.

Markets for wood have a direct influence on consumption. Recessions in the eighties and nineties were noted in the RPFOs for both the GCF and the Kapuskasing CMU, which reduced the softwood volume harvested. Hardwood markets have matured over the 15-year period, but supply continues to exceed demand for lower quality hardwood. As this report is written, rising operational and regulatory costs are threatening the profitability of operations across many parts of the forest sector in Ontario.

Accessibility is a challenge on the GCF and it is noted as a factor in the Trend Analysis. Most wood must be harvested from frozen ground and a late freeze or early thaw can prevent wood from getting to its destination mill in a timely manner.

The Trend Analysis notes higher than planned for by-pass areas in each of the last three planning periods. The report does not detail what proportion of this area was inoperable because it was under-mature but will likely grow into a productive forest in the near term, and what portion was inoperable because it was over-mature and will not return to a productive state for several decades. This information should become available as the new inventory for the Forest is completed. The audit team encourages OMNR, as the

custodians of the new inventory, to complete an analysis of by-passed areas over the last three planning terms (1990-2005). It will be important to confirm the potential of these areas to provide commercial harvest opportunities over time.

Suggestion 9: OMNR should complete an analysis of areas planned for harvest but by-passed from 1990-2005 to confirm the commercial potential of these areas.

The Trend Analysis documents volumes received by mills over the 2000-2004 period. This information is presented in Table 3.

Table 3. Annualized volume of wood delivered to commitment holders from the Gordon Cosens Forest 2000-2004.

Mill	Volume received (m^3)	% of commitment
Tembec Kapuskasing Sawmill	558,997	75
Excel Forest Products	241,848	201
Tembec Hearst Sawmill	245,174	145
Tembec Timmins Sawmill	81,496	68
Lecours Lumber Ltd.	23,219	39
St. Mary's Paper	9,745	65
Cayouette Cabinets	1,165	65
Columbia Forest Products	44,298	76
Norbord Industries	3,424	61
Grant Forest Products Timmins	135,580	82
Grant Forest Products Englehart	13,585	7

The SFL for the GCF requires that Spruce Falls shall make available to local area sawmills, for sawlog/chip exchange or direct sale, approximately 20% of the Company's annual conifer harvest of 750,000 cubic metres. This is the reason Excel Forest Products and Tembec Hearst Sawmill received more than 100% of their commitments.

Hardwood utilization has increased by 75% over the 1995- 2000 term and is expected to continue to increase through the next term. Most of this increase is expected in the non-veneer market established by Grant Forest Products. Grant has commitments for both its Timmins and Englehart mills from the GCF. Most of the hardwood currently harvested from the GCF goes to the Timmins mill, as the mill is closer and the transportation costs are relatively low.

Regeneration has been conducted effectively on this forest. Regeneration targets assume full harvest and any deviation in harvest activity reduces the significance of the target.

The Trend Analysis reports softwood natural regeneration as 192% of that targeted and planting as 67% for the 1990-1995 period. For the 1995-2000 period, conifer regeneration was 98% of that planned. For the current term, actual regeneration was 96% of that planned.

Overall, the areas of softwood regenerated were 103% of the conifer areas depleted. Given the challenges involved in balancing forest depletions and accruals, this is completely acceptable performance.
The Trend Analysis concludes by offering a required summary of objective achievement and assessment of sustainability. This concise summary fairly and favourably captures accomplishments on this forest over the 15-year period considered. There are no obvious shortfalls noted.

3.7.4 Achievement of Forest Sustainability

Parameters to guide the assessment of forest sustainability in Ontario come from a variety of sources. The CFSA defines as its purpose "to provide for the sustainability of Crown forests and in accordance with that objective, to meet social, economic and environmental needs of present and future generations." It further states that determination of sustainability shall be consistent with two principles. They are:

- large healthy diverse and productive Crown forests and their associated ecological processes and biological diversity shall be conserved, and;
- the long-term health and vigour of Crown forests should be provided for by using forest practices, that within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air and social and economic values, including recreational values and heritage values.

In an earlier era, but still pertinent to the period being assessed, the Forest Resource Assessment Policy identified eight guiding principles for the assessment of forest sustainability. They included:

- Forest sustainability is the first priority and overriding principle.
- The area of Ontario's Crown forests, on a provincial scale, must not decline and will be expanded wherever feasible.
- The broad composition of Ontario's Crown forests must be maintained and, where necessary and practical, improved to reflect the desired future forest condition.
- All forests must be assessed and evaluated for their contribution to forest diversity and wildlife habitat.
- Forest management and resource use decisions must consider community and resource use stability.

- Levels of forest use, including timber production, must be decided locally as part of the Ministry's land use and resource management planning processes, within the context of provincial policies and regional strategic directions.
- Levels of forest use, including timber production, must be adaptive to changes in industrial demand, environmental concerns and societal needs.
- Levels of forest renewal must be adequate to sustain the forest.

Using information provided in the 2000-2020 FMP, the Annual Reports, the RPFOs, and the Trend Analysis report, the sustainability of the GCF was assessed.

The long-term size and composition of the forest are critical elements of forest sustainability. Further to the discussion initiated in Section 3.7.3 of this report, the composition of the forest for those species that make up the majority of the GCF has remained relatively stable. Over the last 15 years, the Company and OMNR have been diligent at conducting FTG surveys, thereby expeditiously re-entering stands into the productive forest.

The largest change in species composition has been a reduction in cedar (-40%) and an increase in larch (+12%). This discrepancy is a result of the differences in which working groups were presented in Timber Management Planning Manual (TMPM) (OMNR 1986) Table 8.8.2 and FMPM Table 2. During the 1990-1995 and 1995-2000 plans, the cedar working group was not identified separately, but rather, it combined cedar and larch within the "other conifer" working group. During the 2000-2005 plan, the cedar and larch working groups were presented separately. This explains the shortfall in cedar while at the same time increasing larch levels. Additionally, it should be noted that other minor differences in working group levels can also be attributed to adjustments in the ownership layer, as provided by OMNR, during the last 15 years. These adjustments (e.g., changes in the OLL, freehold, Kapuskasing CMU amalgamation, etc.) affect the number of hectares within the management unit that are considered managed Crown lands.

The Company has taken care to manage tree species that are relatively scarce on the landbase. There are strategies in place to ensure the ongoing presence of red pine, white pine and black ash on the landbase. The HCVF strategy has identified areas that are of ecological significance and has defined programs to enhance or protect them.

The age-class structure of the forest is an indicator of forest condition. Table 5 in the Trend Analysis displays the age-class distribution for the productive forest on the amalgamated GCF. It is difficult to assess change in age class as the forest units provided are not consistent over the 15-year period, nor are the forest units shown in Table 2 consistent with those listed in Table 5 in the Trend Analysis. Table FMP 11 in the 2000 FMP shows currently overage (140+ years) lowland spruce will drive the performance of this forest over the next 30 years through a wood supply reduction of about 13% with subsequent recovery. This gap will result in reduced economic opportunity for the Forest. Unless the Company and OMNR choose to exaggerate the depth and breadth of

this period of shortfall with preferential harvest of younger age classes, this predicted harvest shortfall should not have an impact on the biological sustainability of the Forest. Harvest volumes on the Forest were below those planned for the period 1990-2005. The Trend Analysis attributes this to by-pass by some sawlog operators and inventory that did not identify losses due to budworm mortality. In the 1995-2000 period, amended higher volume areas in the plan mitigated low volumes per hectare. Nine percent of the reduced volume from 2000-2005 was attributed to increased by-pass activity. Candidates for by-pass can include young stands not having enough volume to be economically harvested. In that case, the stand will grow, add volume and be harvestable in the relatively near term if accessible. By-pass may also be a matter of avoiding old stands that have lost volume. This has longer-term economic and environmental implications, as these areas have effectively passed through old age into decadence.

There will be shorter-term economic incentives to by-pass older stands. These stands will become increasingly decadent, which will result in less merchantable volume. Harvesting areas with lower volume increases relative operating costs. In a commodity based business, increased costs may stop economic activity. The auditors have made a suggestion that OMNR examine these by-passed areas to confirm their potential to supply harvest opportunities into the future.

The challenge, clearly identified in the two FMPs reviewed, is to bridge this gap in an economically and environmentally acceptable manner. The audit team has no recommendation on this matter, but it is raised as a question to be monitored as the Forest is managed into the future.

This forest has some of the best historic records of any in the Province. The Company has maintained active files from early in the last century and has been running a PSP program for the better part of 60 years.

Planning activities are well done. The Company, as evidenced by the additional work done to secure its FSC certification, performed planning functions at a higher than normal level. Harvest operations are well planned and, with the exception of one block where rutting was observed at a higher level than reported on inspection forms, well monitored. The lag between depletion and regeneration is kept to a minimum. The auditors witnessed many blocks where planting had been completed before the log haul was finished. FTG surveys are conducted promptly. A large majority of stands on the Forest have reached FTG status within the time period predicted.

Areas needing improvement have been noted throughout this report. These are relatively minor findings. Given the Company's success in meeting stated objectives, and the good performance in planning and operations, the audit team is of the opinion this forest is being managed sustainably.

3.8 Contractual Obligations

The GCF is currently managed under the terms of an SFL (#550039), which was in effect as of May 9, 2001. Tembec managed the Forest as a deemed SFL for the previous year of the audit term. Under both the license holder and deemed license holder scenarios, Tembec has a number of contractual obligations that must be fulfilled. This section reviews the Company's success in meeting their obligations.

The 2000 IFA report for the GCF (KBM Forestry Consultants Inc. 2001) included two recommendations and six suggestions directed at both the Company and OMNR. The Action Plan developed in response to the audit was approved in January of 2002. The audit team found compliance with the procedures required to be followed after the tabling of that audit report. The Action Plan was endorsed by the Regional Director and officially acknowledged by OMNR's Forest Management Branch.

According to the Status Report, the Company and OMNR have acted upon the recommendations and Action Plan items from the 2000 audit. The first recommendation that OMNR confirm the adequacy of fisheries information on all water bodies proposed for harvest to the waters edge has been addressed. Both parties have committed that "harvesting to the water's edge will only occur in locations where fisheries information is adequate."

The second recommendation required the Company "to develop methods to reduce roadside slash by at least 50% on upland sites." This audit reviewed evidence to support the actions taken. Activities to address this recommendation are ongoing. We have recommended that this item be revisited to ensure solutions are economically and logistically viable.

Examination of the Forest Renewal Trust Fund account, and the record keeping required to support it, found full compliance with the license requirements. The sample of silvicultural expenditures tested was found to be accurate for eligible activities. Interim and final invoices were filed appropriately and were authorized by a registered professional forester. Minimum balances were maintained in the Forest Renewal Trust Fund account on March 31st of each year, as required.

Tembec has satisfied its planning obligations under the terms of its license and the Company's performance in terms of monitoring and reporting has been very strong. The Company is conducting compliance inspections as proposed in the compliance plans and Annual Reports are submitted by the required deadlines.

Under the terms of its SFL, as per Appendix E and F of the license document, Tembec is obligated to comply with the wood supply commitments to the following companies:

- Excel Forest products
- Lecours Lumber Ltd.
- Tembec Industries Inc. Hearst

- Tembec Industries Inc. Timmins
- Columbia Forest Products – Levesque Division
- Cayouette Cabinets
- Grant Forest Products Timmins
- Grant Forest Products Englehart
- St. Mary's Paper
- Synco Timber
- Norbord Industries Inc.
- White Cedar Products Inc.

The auditors interviewed representatives from all parties except three. With the exception of the Tembec sawmills in Hearst and Excel Forest Products, none of the industries have received their full commitment of wood during the audit period. Representatives were explicit, however, in stating that wood was flowing from this forest in an acceptable manner. Tembec is obligated under the terms of its SFL to complete Memorandums of Agreement (MOAs) with these commitment holders, and these have not been completed in the majority of cases. The audit team recommends that the Company complete all outstanding MOAs within three years of the publication of this audit report, or complete negotiations with OMNR to have the obligation to complete MOAs removed from its SFL.

Recommendation 9: The Company should complete all outstanding Memorandums of Agreement within three years of the publication of this audit report, or complete negotiations with OMNR to have the obligation to complete Memorandums of Agreement removed from its Sustainable Forest License.

Third party operators expressed some concern at the lack of transparency in harvest planning and volume allocations during the 2000-2005 planning period. The same operators commented that the situation seemed to have been corrected over the summer of 2005. The audit team suggests that a commitment to transparency in harvest block allocations from the GCF should be a common factor in the MOAs to be negotiated.

Suggestion 10: A commitment to transparency in harvest block allocations from the Gordon Cosens Forest should be a common factor in the Memorandums of Agreement to be negotiated.

An assessment of the Company's performance in meeting its obligations related to compliance monitoring is discussed under Section 3.6 of this report. The Company has met its obligations in this regard.

The Company's performance in meeting its obligations related to observing the provisions of the SGRs is generally covered under Sections 3.3.7, 3.4.3, and 3.4.4 of this report. The audit team's findings confirm that Tembec has met its license obligations with respect to this matter.

The Company's performance in meeting its obligations related to preparing the required FMPs, AWSs, and associated reports is covered elsewhere throughout this report. The Company has met its obligations on this matter in all respects.

The Company's performance in meeting its obligations related to the assessment of harvested areas is generally discussed under Section 3.4.2 of this report. Tembec has met its license obligations in this regard.

Other contractual obligations related to maintaining records of eligible silviculture work reimbursed by the Forest Renewal Trust Fund have been met by the Company. The *Specified Procedures Report* (KPMG 2005a and KPMG 2005b) reviewed all charges to the Forest Renewal Trust Fund recorded by Tembec for the period between April 1, 2003 and March 31, 2004. As a matter of verifying expenses charged to the trust fund accounts, the audit team inspected, as part of the overall audit sampling, sites where silvicultural treatments had taken place during the 2003-2004 operating year. These site inspections routinely included a review of the silvicultural prescription for the site, a field inspection of the silvicultural activities that had taken place (i.e., site preparation, planting, seeding, or tending) and an assessment of the effectiveness of the treatment. Sites were also tracked through the FMP, AWSs, and Annual Reports. The auditors were able to match consolidated billings with Annual Report figures, as well as match treatment prescriptions in the AWS with work observed on the ground. The audit team is confident that appropriate procedures are employed by Tembec management to ensure that charges to the Forest Renewal Trust Fund accurately reflect silvicultural activities that have taken place on the ground.

4.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

In this audit of the GCF, the audit team found that Tembec and the OMNR are managing the Forest satisfactorily, and that both parties are meeting their obligations.

A few deficiencies were found and issues were identified. All require action or the parties will run the risk of these deficiencies becoming chronic issues. Aspects of the management and operation of the Forest requiring corrective action or improvement on the part of Tembec relate primarily to planning team activities and roadside slash pile/logging debris management.

The auditors feel that the Tembec and OMNR employees involved with the administration of the GCF are knowledgeable and very capable of managing the Forest in a sustainable manner. Both organizations maintain sufficient staffing resources to ably carry out operations and administrative functions associated with managing the Forest.

Harvesting operations are being conducted as prescribed and are being diligently monitored. Proper compliance monitoring and reporting procedures are being followed. Dedicated efforts are being made to quickly restore depleted forestlands to a productive

state through artificial or natural means. Company staff are conducting the appropriate surveys to monitor the progress of renewal, applying tending treatments if necessary, and reporting the outcomes as required. The audit team's observations and evidence from the field inspections confirmed that sufficient efforts are being made to manage the Forest on a sustainable basis. Analysis of operational results over the audit term indicated that renewal levels are sustaining or exceeding current harvest levels.

Based upon its review of the evidence and its observations, the audit team has concluded that the GCF is well managed and that the Licensee is meeting all of the terms and conditions of the SFL in a diligent and proactive manner. OMNR is also meeting its overall responsibilities associated with its role in managing this forest. The findings also led the audit team to determine that management of the Forest was in compliance with the legislation, policy, and regulations that were in effect during the 2000-2005 audit term. The audit team is confident in concluding that the GCF is being managed sustainably. For these reasons, the auditors are making the following recommendation:

Recommendation 10: The auditors recommend that the term of the Sustainable Forest License for the Gordon Cosens Forest be extended for an additional five years.

This audit report identifies 10 recommendations and 10 suggestions that address the non-compliances and shortcomings that were found. Two best practices were identified. Table 4 summarizes the recommendations, suggestions, and best practices by each broad audit principle.

Table 4. Recommendations, suggestions, and best practices arising from the audit.

Principle 1: Commitment
None
Principle 2: Public Participation
Recommendations: 1) OMNR must ensure that the Local Citizens' Committee follows its Terms of Reference and continues to address the procedural challenges of the Committee, including the organization and facilitation of meetings. 2) OMNR is to determine whether the Moose Cree First Nation is willing to share its values information and, if so, identify whether the information is useful for values protection and, if it is, then develop a protocol as to how the values information is to be used in forest management planning. **Suggestion:** 1) Provincially, OMNR should consider developing a common set of ground rules, procedures and/or policies on how to address native trappers' issues.

Best Practice:

1) Tembec's efforts at working with the Moose Cree First Nation on a variety of operational and relationship issues are at the forefront of industry and First Nations relations in Ontario.

Principle 3: Forest Management Planning

Recommendation:

3) The Steering Committee for the planning team should monitor team progress more aggressively to facilitate resolution of issues and ensure all pertinent information is brought forward in a timely way.

Principle 4: Plan Implementation

Recommendations:

4) The Company should formalize their program for repairing and closing-in bridge deck surfaces on bridges that they are responsible for, and set a timetable for completion.

5) OMNR should review their program for approval of bridge designs, to ensure they are provided in a timely manner.

Suggestions:

2) Given the importance of trapping on the Gordon Cosens Forest, and the importance of beaver to that activity, during the next planning cycle, the planning team should consider specific shoreline management prescriptions for beaver in suitable beaver habitat areas.

3) The Company and OMNR are encouraged to seek alternative approaches to slash management that will use modified harvest techniques to reduce the concentration of slash or find commercial uses for slash that will reduce or eliminate the cost of landbase recovery.

4) Tembec should consider strengthening the renewal support text in the forest management plan to illustrate how the Company is making valuable contributions to the tree improvement program.

Best Practice:

2) Tembec and OMNR are commended for consistent efforts to develop effective wet soil operating techniques.

Principle 5: Systems Support

Recommendation:

6) Corporate OMNR shall develop specifications that more clearly define staff responsibilities for meeting the planning inventory verification requirements outlined in Section 5.3.3 of the Forest Information Manual. The specifications should include a format for documenting the acceptance and notification process.

Suggestion:

5) The Company should seek outside funding for protecting and digitizing the valuable 1947 aerial photography of the Forest.

Principle 6: Monitoring

Recommendations:

7) OMNR should establish and maintain environmental guideline monitoring programs to ensure guidelines effectively and efficiently meet their stated objectives.

8) The Company should ensure that future Annual Reports prepared for the Gordon Cosens Forest comply with the requirements of the Forest Management Planning Manual. Specifically, the text should include a summary of action items prepared in response to Independent Forest Audits.

Suggestions:

6) The Company should request a delegation from OMNR under the Guideline for Forest Industry Compliance Planning, January 2005, so that the overlapping licensees can continue to submit compliance reports directly to OMNR.

7) The planning team should consider using a scoring system for selecting the management alternative that is less weighted to far future indicator values.

8) The Annual Reports should contain more descriptive text explaining reasons for deviations for all aspects of forest operations, analysis on progress toward achieving forest management plan targets (where possible), and more detailed discussion around emerging trends.

Principle 7: Achievement of Management Objectives and Forest Sustainability

Suggestion:

9) OMNR should complete an analysis of areas planned for harvest but by-passed from 1990- 2005 to confirm the commercial potential of these areas.

Principle 8: Contractual Obligations

Recommendation:

9) The Company should complete all outstanding Memorandums of Agreement within three years of the publication of this audit report, or complete negotiations with OMNR to have the obligation to complete the Memorandums of Agreement removed from its Sustainable Forest License.

Suggestion:

10) A commitment to transparency in harvest block allocations from the Gordon Cosens Forest should be a common factor in the Memorandums of Agreement to be negotiated.

Conclusion

Recommendation:

10) The auditors recommend that the term of the Sustainable Forest License for the Gordon Cosens Forest be extended for an additional five years.

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APPENDIX A – COMPARISON AND TREND ANALYSIS OF PLANNED VS. ACTUAL OPERATIONS

Note: Information in this report is appended as submitted by Tembec Inc.

Comparison and Trend Analysis of Planned vs. Actual Forest Operations for the GORDON COSENS FOREST

Prepared for the 2000-2005 Independent Forest Audit

Prepared by:
Kevin Del Guidice, R.P.F. #1944
Tembec Industries Inc

August 25, 2006

Date

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4.0 CONCLUSION

1.0 Introduction

This trend analysis compares the planned and actual forest management activities that occurred on the Gordon Cosens Forest (GCF) during the period April 1, 2000 to March 31, 2005. The analysis also includes a summary of planned versus actual forest management activities, which occurred on the forest during the two previous 5-year planning terms (1990-1995 & 1995-2000). In addition, this analysis highlights significant milestones and historical events that have occurred on the forest.

As a result of the amalgamation of the GCF and Kapuskasing Crown Management Units (KCMU), effective April 1, 2000, changes in management responsibilities occurred on the GCF for the 2000-2005 five-year planning term.

The development of the 2000-2020 Forest Management Plan (FMP) for the GCF was the responsibility of Spruce Falls Inc. (Spruce Falls), a wholly-owned subsidiary of Tembec Industries Inc, situated in Kapuskasing, Ontario. In addition, Spruce Falls was responsible for the development of the 1990-2010 and 1995-2015 Timber Management Plan (TMP) for the GCF.

The Ontario Ministry of Natural Resources (OMNR) was responsible for the development of all TMPs and FMPs on the KCMU prior to its amalgamation with the GCF in 2000, as described in section 1.1.

Since the approval of the 2000-2020 FMP, 26 amendments were undertaken. Of these, one was a major amendment relating to the addition and replacement of harvest allocations, two were minor amendments relating to harvest allocations and twenty-three were treated as administrative amendments.

The timber harvested during the current five-year term was a balance of over-mature timber and mature timber. The allowable harvest for the 2000-2005 term was calculated using the Strategic Forest Management Model (SFMM) Version 1.5c. The Forest Management Guidelines for the Provision of Marten were implemented into the 2000-2020 FMP.

1.1 Gordon Cosens Forest

The Gordon Cosens Forest is situated in the Ontario Ministry of Natural Resources (OMNR) Northeast Region. The boundary of the Gordon Cosens Forest overlaps four OMNR district boundaries including Cochrane, Chapleau, Hearst and Timmins. Hearst District is the lead district in administering the GCF.

The boundary of the GCF reflects the amalgamation of the former Kapuskasing CMU with the GCF. This boundary change was officially designated on April 1, 2000. The original boundary of the GCF was established in 1980 with the signing of the Forest Management Agreement (FMA) on September 19th of that year.

The original boundary of the KCMU was created on October 26, 1989 as a result of the amalgamation of the KCMU and a portion of the Opasatika Crown Management Unit which was omitted from the Hearst Forest when it was established in 1986.

The new boundary of the Gordon Cosens Forest also reflects the completion of an exchange of Spruce Falls' former freehold area located on the west side of the management unit, along the Missinaibi River, for an area located in the south-central portion of the management unit. As a result of this exchange, Spruce Falls' freehold land now consists of three townships and parts of two others located in the southern portion of the management unit totalling 74,726 hectares. The former Spruce Falls freehold lands, along the Missinaibi River, are now Crown land and form part of the GCF.

There are numerous communities located adjacent to the management unit including Strickland, Fauquier, Moonbeam, Kapuskasing, Val Rita-Harty, Opasatika and Mattice. There are no First Nations communities within the management unit. Flying Post First Nations reserve is adjacent to the management unit, but there are no members living on this reserve.

The Sustainable Forestry Licence holder on the Gordon Cosens Forest is Spruce Falls Inc., which held a harvest allocation of 758,000 cubic metres of conifer to be harvested annually. Of the 758,000 cubic metres, 8,000 cubic metres was directed to St. Mary's Paper in Sault Ste. Marie. The Kapuskasing complex depends on conifer (predominantly spruce) and aspen chips from overlapping licensees, as outlined in their overlapping licence. In addition to Kapuskasing, the Gordon Cosens Forest was also a source of round wood supply for the following mills:

- Excel Forest Products (Opasatika) – spruce-pine-fir (SPF)
- Lecours Lumber Co. Limited (Calstock) - SPF
- Tembec Industries Inc. (Hearst) - SPF
- Tembec Industries Inc. (Timmins) - SPF
- Columbia Forest Products – Levesque Division (Hearst) - Veneer aspen and white birch
- Cayouette Cabinets (Moonbeam) – aspen sawlogs, SPF, cedar, Non-veneer white birch
- Grant Forest Products (Englehart & Timmins) - non-veneer aspen and white birch
- St. Mary's Paper Ltd. (Sault Ste. Marie) –spruce and balsam fir
- Nordbord Ltd. (Cochrane) – Veneer aspen

Synco Timber Ltd. is a traditional licensee from the former Kapuskasing CMU, which harvested part of the St. Mary's commitment. During the 2000-2005 planning term, White Cedar Forest Products holds a commitment for Cedar from the GCF. In addition to the above, there are a number of smaller operators that harvested residual species, such as larch and white birch for personal use and fuelwood.

Several companies, including Excel Forest Products, Lecours Lumber Co. Limited, Tembec Industries Inc. (Hearst) and Tembec Industries Inc. (Timmins) also shared some responsibility for forest management through overlapping licence agreements with Spruce Falls.

1.2 GCF - Historical Events and Milestones

Between 1900 and 1910, largely as a result of settlement, railway development and interest in establishing pulp and paper mills and hydroelectric sites, the first surveys of the Gordon Cosens Forest were conducted. These surveys mainly focused on organized townships.

The first licence on the current GCF, which was known at the time as The Kapuskasing Pulp and Timber Limit, was completed in 1918. These limits were purchased by Messrs. Mundy and Stewart, who then transferred them to Spruce Falls Company Limited in 1920. The Spruce Falls

Company Limited was incorporated as the Spruce Falls Power and Paper Company Limited (SFPP) in 1926.

Since then, various vintages of forest inventory have been completed over time on the Gordon Cosens Forest . This information presently exists in a number of different formats. The following details the various forest inventory events that have occurred since 1947:

- In 1947, aerial photography (1:50,000) was taken for a major portion of the Gordon Cosens Forest, then known as the Spruce Falls Power and Paper (SFPP) limits. This photography was then used by George Beare to produce the first detailed landform-based inventory in the region. Forest managers still utilize this information today to assist in making forest management decisions.
- In 1963, aerial photography (1:15,840) was taken and 1:15,840 inventory maps were produced for the SFPP limits.
- In 1972, aerial photography (1:15,840) was taken and a forest inventory was completed in 1973 for the SFPP limits.
- In 1979, aerial photography (1:15,840) of the Kapuskasing CMU was taken and a forest inventory was completed the following year.
- In 1986, aerial photography (1:20,000) was taken of the Gordon Cosens Forest, and the first digital forest resource inventory (FRI) was produced the following year. This also marked the beginning of the Ontario Base Maps (OBM) series.
- In 1987, the annual supplemental aerial photography program was initiated to track actual depletions and facilitate their update into the inventory. This program continues to this day.
- In 1988, the Hunter GIS was purchased. This marked the first time spatial information was tracked digitally on this forest.
- In 1994, aerial photography (1:20,000) was taken of the Kapuskasing CMU with a digital FRI being completed the following year.
- In 1997, aerial photography (1:20,000) was taken of the former Spruce Falls freehold lands (along the Missinaibi River) and a digital FRI was completed the same year.
- In 1998, Spruce Falls converted from the Hunter Geographical System (GIS) to the ARCINFO GIS.
- In 2002, aerial photography (1:20,000) was flown over 55% of the GCF to initiate a re-inventory process on the forest. Although the re-inventory was not completed, the photography was used extensively during the production of the 2005-2025 FMP.

A number of events related to area mills occurred during the past three planning terms (1990-1995, 1995-2000, and 2000-2005) that have shaped the evolution of the forest industry in the Kapuskasing area. The following is a timeline of these events:

- Spruce Falls Inc. was formed in December 1991 by an employee acquisition (52%) of the Kapuskasing mill owned by Kimberly-Clark Corporation and the New York Times, in partnership with Tembec Inc. (41%), and residents of Kapuskasing and surrounding communities (7%).
- In 1993, the high yield thermo-mechanical pulp plant began operations at the Kapuskasing site.
- In 1994, the Kapuskasing sawmill was constructed by Spruce Falls Inc. as a 2-line, 2-shift sawmilling facility geared to consuming smaller diameter SPF.
- In 1995, Tembec Inc. purchased Malette Inc, including the Hearst Sawmill and Timmins Sawmill.

- In 1995, the No. 1 paper machine was rebuilt and re-started operations at the Kapuskasing site.
- In 1996, the high yield thermo-mechanical pulp plant was expanded at the Kapuskasing site.
- In March 1997, Spruce Falls Inc. became a subsidiary of Tembec Industries Inc. when Tembec acquired all of the shares of Spruce Falls Acquisition Corp.
- On April 1, 2000 the former Kapuskasing CMU was amalgamated to the GCF. Concurrently, an exchange of Spruce Falls' former freehold for an area located in the south-central portion of the management unit was completed.
- In 2001, Tembec purchased 50% ownership of the Excel Sawmill (Opasatika).
- In 2004, Tembec Industries Inc. acquired full-ownership of the Excel sawmill.
- In 2004, the No. 1 paper machine was shut down at the Kapuskasing site.
- In 2005, Tembec Industries Inc. closed the Excel sawmill. Fibre previously allocated to the Excel mill has been redirected, with a portion to the Tembec Industries Inc. sawmill in Hearst and the Tembec Industries Inc. mill in Kapuskasing.

A number of management milestones have also occurred during the past three planning terms. The following is a short summary of these milestones:

- In 1980 Spruce Falls Power and Paper Company, Limited entered into a Forest Management Agreement with the province of Ontario on the Gordon Cosens Forest.
- In 1992, the 150-millionth tree was planted on the Gordon Cosens Forest.
- In 1998, the 200-millionth tree was planted on the Gordon Cosens Forest.
- In 1999, Tembec was awarded ISO 14001 certification as it applies to Tembec's Forever Green® environmental management program and to forest management activities on the Gordon Cosens Forest and associated freehold land.
- In 2001, the deemed Sustainable Forest License (500600) on the GCF became a Sustainable Forest License (550039).
- In 2003, Tembec received a Forest Stewardship Council (FSC) certificate for its forest resource management practices on the Gordon Cosens Forest. FSC certification is the world's highest endorsement for environmentally and socially responsible forestry practices.
- In 2004, the 250-millionth tree was planted on the Gordon Cosens Forest.

2.0 Comparison and Trend Analysis

This report contains information drawn from the Reports of Past Forest Operations (RPFO)'s for the activities, which occurred on the GCF during the 1990-1995, 1995-2000 and 2000-2005 five-year planning terms. As per the new planning requirements of the 2004 Forest Management Planning Manual, annual report submissions are now due on November 15 of each year. Therefore, the final Annual Report for 2004-2005 was not available for this report. As a result, the harvest area and volume for the 2004-2005 term has been estimated using the most current data available.

2.1 Summary of Total Area Under Management

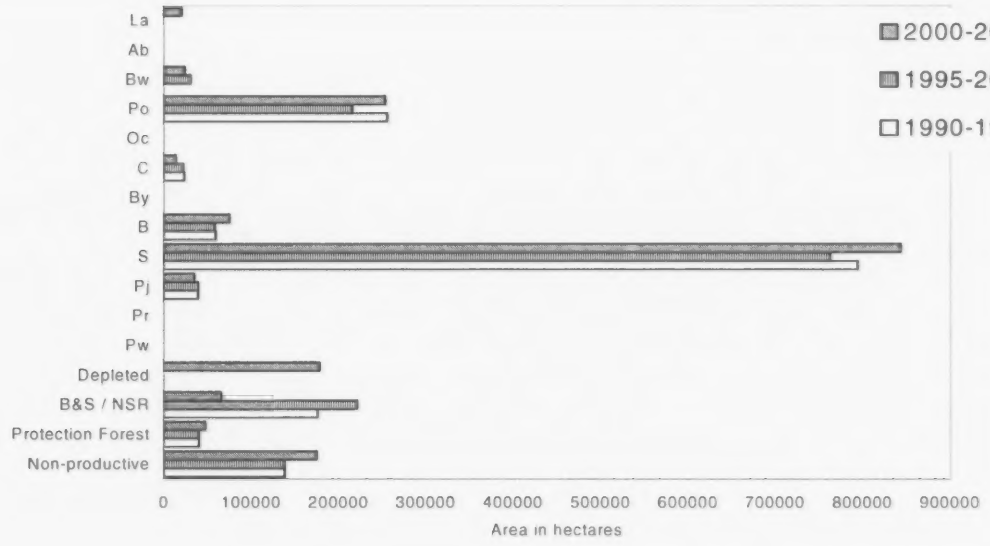
Table 1 provides a summary of the total Crown-managed land-base under management for past and current plans. This land-base is categorized by the following land types: non-forested, forested, and production forest. Information presented in this table was taken from Table 4.8.2 of the 1990-2010 and 1995-2015 TMP, as well as Table 1 of the 2000-2020 FMP. As shown in the table, the total

production forest area and total forested area remained constant between the 1990-1995 and 1995-2000 five-year planning terms.

2005 Independent Forest Audit
Table 1 - Summary of Total Area Under Management

Past and Current Plans - Crown Managed
MU: Gordon Cosens Forest

Land Type	Plan Term	Area in hectares: Past Plans 1990-1995	Past Plans 1995-2000	Current 2000-2005
Non-Forested				
Other Land		68,991	69,226	96,138
Forested				
Non-productive		138,722	138,455	175,608
Productive				
Protection		40,827	40,827	48,282
Production Forest				
B&S / NSR		176,437	221,728	66,301
Depleted		-	-	178,692
Forest Stands by Working Group				
Pw		62	62	62
Pr		-	-	
Pj		39,742	39,742	35,283
S		794,793	763,304	843,995
B		59,991	59,138	75,958
By		-	-	-
C		23,953	22,953	14,390
Oc		-	-	287
Po		255,957	216,319	253,489
Bw		-	31,037	24,514
Ab		-	-	-
La		-	-	20,755
Total Production Forest		1,350,935	1,354,283	1,513,726
Total Forested Land		1,530,484	1,533,565	1,737,616



Source: FMPM Table FMP-1, FMP-2
TMPM Table 4 8.2

However, the total production forest increased by 10% in the 2000-2005 five-year planning term. In addition, the total forested area increased by nearly 11% over the same period. These increases are due to the following events:

- The completion of the exchange of Spruce Falls' former freehold area located along the Missinaibi River for an area located in the south-central portion of the management unit.
- Ontario's Living Legacy – Approved Land Use Strategy, 1999 has withdrawn areas of mature and over-mature forest situated on the landscape.
- The amalgamation of the Kapuskasing CMU with the GCF.
- Inventory updating procedures and accuracy of data management systems. Such updates have played a minor role in land base fluctuations over time.

2.2 Description of Forest Units

Table 2 describes the forest units that were used for the 1990-1995, 1995-2000, and 2000-2005 five-year planning terms. Traditionally, forest units on the Gordon Cosens Forest have been based on eco-site type information that has been linked directly to the Forest Resource Inventory (FRI) through the use of forest unit descriptors, which describe the site and stand composition features associated with each forest stand.

The forest units that were developed for the 2000-2005 five-year planning term are similar to those employed in previous plans on this forest. The number of forest units was, however, increased from six in the 1995-2015 FMP to eight during the 2000-2020 FMP in order to subdivide the upland forest unit into a more practical operational group based on Forest Unit Modifier. These new forest units also tied in closely with the forest units that were being used in adjacent forests including the former Kapuskasing CMU.

2005 Independent Forest Audit

Table 2 - DESCRIPTION OF FOREST UNITS (TMP 4.11) for 1990-1995

MU: Gordon Cosens Forest

Forest Unit		Forest	Main	Site	Silvicultural	FRI Parameters	Additional
Code	Name	Type	Working Group	Type(s)	System	& Criteria	Information
P-C	Jack Pine	Conifer	Jack Pine	Predominantly Site Type 2 with minor occurrences on Site Type 3 & 4	Clearcut	FU = P or FU = U & Pj >= 0.5	
L-SF	Lowland Spruce Flat	Conifer	Black Spruce	Predominantly Site Types 11 & 12 with minor occurrences on Site Type 8 & 9	Clearcut	FU = L & FUM = SF or Null	
L-SWP	Lowland Spruce Swamp	Conifer	Black Spruce, Cedar, Larch, Other Conifer	Predominantly Site Type 13 with minor occurrences on Site Types 9, 12 & 14	Clearcut	FU = L & FUM = SW	
N-M	Non-marketable	Conifer	Black Spruce, Cedar, Larch, Other Conifer	Predominantly Site Types 11 & 13 with minor occurrences on Site Types 8, 9 & 12	Clearcut	FU = N1 or N3	
U-V	Upland Conifer	Conifer	Black Spruce, Balsam Fir	Predominantly Site Types 5 & 9 with minor occurrences on Site Types 6 & 8	Clearcut	Po+Bw < 30% or FU = U & FUM = C or Null	
U-M	Upland Mixed	Mixedwood	Black Spruce, Balsam Fir, Poplar	Predominantly Site Types 7 & 10 with minor occurrences on Site Types 6 & 9	Clearcut	Po+Bw >= 30% & Po+Bw < 80% or FU = U & FUM = M	
U-OB/OH	Upland Depleted	Mixedwood	Black Spruce, Balsam Fir, Poplar	Predominantly Site Types 10 & 6 with minor occurrences on Site Types7 & 9	Clearcut	Po+Bw >= 30% & Po+Bw < 80% or FU = U & FUM = M or C & OM = OB or OH	
H	Hardwood	Intolerant Hardwood	Poplar, White Birch	Predominantly Site Types 7 & 10	Clearcut	Working Group = 33 or 36 & Po+Bw >= 80% or FU = U or H & Po+Bw >= 80%	

Source: TMPM Table 4.11
FMPM Table FMP-8

2005 Independent Forest Audit

Table 2 - DESCRIPTION OF FOREST UNITS (TMP 4.11) for 1995-2000

MU: Gordon Cosens Forest

Forest Unit Code	Forest Unit Name	Forest Type	Main Working Group	Site Type(s)	Silvicultural System	FRI Parameters & Criteria	Additional Information
P-C	Jack Pine	Conifer	Jack Pine	Predominantly Site Type 2 with minor occurrences on Site Type 3 & 4	Clearcut	FU = P or FU = U & Pj >= 0.5	
L-SF	Lowland Spruce Flat	Conifer	Black Spruce	Predominantly Site Types 11 & 12 with minor occurrences on Site Type 8 & 9	Clearcut	FU = L & FUM = SF or Null	
L-SWP	Lowland Spruce Swamp	Conifer	Black Spruce, Cedar, Larch, Other Conifer	Predominantly Site Type 13 with minor occurrences on Site Types 9, 12 & 14	Clearcut	FU = L & FUM = SW	
N-M	Non-marketable	Conifer	Black Spruce, Cedar, Larch, Other Conifer	Predominantly Site Types 11 & 13 with minor occurrences on Site Types 8, 9 & 12	Clearcut	FU = N1 or N3	
U-V	Upland Conifer	Conifer	Black Spruce, Balsam Fir	Predominantly Site Types 5 & 9 with minor occurrences on Site Types 6 & 8	Clearcut	Po+Bw < 30% or FU = U & FUM = C or Null	
U-M	Upland Mixed	Mixedwood	Black Spruce, Balsam Fir, Poplar	Predominantly Site Types 7 & 10 with minor occurrences on Site Types 6 & 9	Clearcut	Po+Bw >= 30% & Po+Bw < 80% or FU = U & FUM = M	
U-OB/OH	Upland Depleted	Mixedwood	Black Spruce, Balsam Fir, Poplar	Predominantly Site Types 10 & 6 with minor occurrences on Site Types7 & 9	Clearcut	Po+Bw >= 30% & Po+Bw < 80% or FU = U & FUM = M or C & OM = OB or OH	
H	Hardwood	Intolerant Hardwood	Poplar, White Birch	Predominantly Site Types 7 & 10	Clearcut	Working Group = 33 or 36 & Po+Bw >= 80% or FU = U or H & Po+Bw >= 80%	

Source: TMPM Table 4.11
FMPM Table FMP-8

2005 Independent Forest Audit

Table 2 - DESCRIPTION OF FOREST UNITS (FMP-8) for 2000-2005

MU: Gordon Cosens Forest

Forest Unit		Forest	Main	Site	Silvicultural	FRI Parameters	Additional
Code	Name	Type	Working Group	Type(s)	System	& Criteria	Information
Pn1	Jack Pine	Conifer	Jack Pine	Predominantly Site Type 2 with minor occurrences on Site Type 3 & 4	Clearcut	Primary Site Type = 2,3 or 4 & Working Group = 07 or FU = P or FU = U & Pj >= 0.5	
Lsf	Lowland Spruce Flat	Conifer	Black Spruce	Predominantly Site Types 11 & 12 with minor occurrences on Site Type 8 & 9	Clearcut	Working Group = 10 or 11 & Primary Site Type = 11 or 12 or FU = L & FUM = SF or Null	
Lsw	Lowland Spruce Swamp	Conifer	Black Spruce, Cedar, Larch, Other Conifer	Predominantly Site Type 13 with minor occurrences on Site Types 9, 12 & 14	Clearcut	Working Group = 10, 11, 17, 18 or 19 & Primary Site Type = 13 or Working Group = 10, 11, 17, 18, 19 & Site Type = 9 or 12 & La >= 0.3 or FU = L & FUM = SW	
Ltn	Lowland Transition (Non-marketable)	Conifer	Black Spruce, Cedar, Larch, Other Conifer	Predominantly Site Types 11 & 13 with minor occurrences on Site Types 8, 9 & 12	Clearcut	Working Group = 10, 11, 17, 18 or 19 & FU = N1 or N3	
Upc	Upland Conifer	Conifer	Black Spruce, Balsam Fir	Predominantly Site Types 5 & 9 with minor occurrences on Site Types 6 & 8	Clearcut	Working Group = 10, 11 or 13 & Site Type = 2, 3, 4, 5, 6, 8, or 9 & Po+Bw < 30% or FU = U & FUM = C or Null	
Upm	Upland Mixed	Mixedwood	Black Spruce, Balsam Fir, Poplar	Predominantly Site Types 7 & 10 with minor occurrences on Site Types 6 & 9	Clearcut	Working Group = 10, 11 or 33 & Primary Site Type = 6, 7, 9, or 10 & Po+Bw >= 30% & Po+Bw < 75% or FU = U & FUM = M	
Upd	Upland Depleted	Mixedwood	Black Spruce, Balsam Fir, Poplar	Predominantly Site Types 10 & 6 with minor occurrences on Site Types7 & 9	Clearcut	Working Group = 11, 33 or 36 & Primary Site Type = 6, 7, 9, or 10 & Po+Bw >= 30% & Po+Bw < 75% or FU = U & FUM = M or C & OM = OB or OH	
Hwd	Hardwood	Intolerant Hardwood	Poplar, White Birch	Predominantly Site Types 7 & 10	Clearcut	Working Group = 33 or 36 & Po+Bw >= 75% or FU = U or H & Po+Bw >= 75%	

Source: TMPM Table 4.11
FMPM Table FMP-8

2.3 Summary of Average Planned and Actual Harvest Volumes

Table 3 provides a summary of the annualized planned and actual volumes for the 1990-1995, 1995-2000, and 2000-2005 five-year planning terms. The volumes for 2000-2005 were derived from the first four annual reports completed for the five-year planning term and current OMNR TREES data, which was used to estimate the 2004-2005 volumes.

Planned volume levels were taken from TMP table 4.18.1 for 1990-1995 and 1995-2000, and from FMP Table 21 for 2000-2005. Actual volumes were summarized from TMP Table 4.3.1, FMP Table RPFO-4, and annual reports.

2.3.1 The 1990-1995 Five-Year Planning Term

During the 1990-1995 five-year planning term, utilization of conifer was 89% of the planned harvest volumes. Certain stands containing pulp-size wood, were bypassed by sawlog operators when consistent markets could not be found. In addition, volume estimates in stands partially depleted by the spruce budworm and second growth stands were not reliable. The past strategy, designed to deal with this problem, had been to allocate surplus stands adjacent to an operator's allocation and to make these areas available if a shortfall were encountered.

During this term, poplar continued to be an under-utilized species with 78% of this species being utilized. In addition, much of the poplar working group was comprised of balsam poplar, which at the time was not a commercially viable species. As a result, many of these areas were not harvested since the removal of only the veneer quality aspen would have caused unacceptable levels of stand damage to the remaining trees.

2.3.2 The 1995-2000 Five-Year Planning Term

During the 1995-2000 five-year planning term, timber harvest volume targets for the Kapuskasing site and the surplus volume targets for the third parties were essentially met (including 95,658 cubic metres of wood harvested in 1999-2000 that was not hauled until 2001 due to early winter break-up).

The actual average SPF volume per hectare recorded for the 1995-2000 five-year planning term was approximately 59 cubic metres per hectare (conifer volume harvested divided by sum of harvest and bypass area) which was significantly less than what was expected, most notably in the Camp 115 area. Additional area in the form of second growth harvest area and contingency area was amended into the plan during the 1995-2000 five-year planning term to offset this shortfall in volume.

During this term, the actual hardwood harvest volume accounted for 52% of the forecast (FORMAN) hardwood harvest volume. This was primarily due to the lack of consistent markets for the full utilization of aspen and birch. Some residual hardwood was carried forward into the 2000-2005 five-year planning term to allow for the completion of second-pass harvest operations and renewal treatments.

Columbia Forest Products, Levesque Division in Hearst, harvested the majority of the aspen harvesting during the five-year term for veneer. This veneer was for the most part derived from selective cutting of stands previously harvested for their conifer component. Only those trees or parts of trees that met the high quality requirements for veneer logs were removed.

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Table 3 - Summary of Planned & Actual Harvest Volumes

MU: Gordon Cosens Forest

Average Planned Annual Harvest Volumes

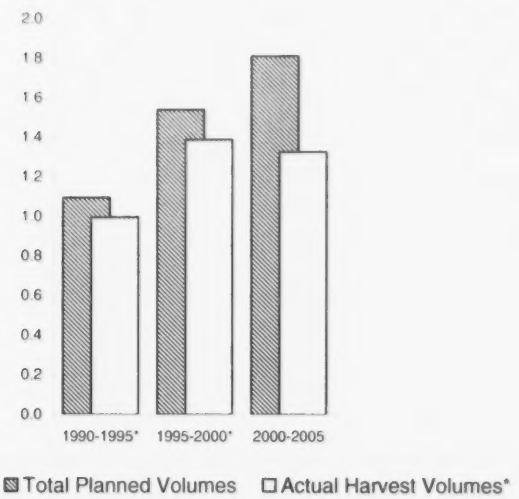
Volumes are Annualized for the indicated 5 year period

	Volume in '000's cubic metres		
	Past Plans		Current
Species	1990-1995	1995-2000	2000-2005
Pw	-	-	-
Pr	-	-	-
Pj	76	100	55.2
Sp	939	1,070	1,086.6
Bf	20	85	88.5
C	-	-	25.6
La			
Po	58	283	467.7
Bw	-	-	47.6
Oh	-	-	37.5
Total Planned Volumes	1,093.4	1,538.3	1,808.8

Actual Harvest Volumes

Volumes are Annualized for the indicated 5 year period

	Volume in '000's cubic metres		
	Past Plans		Current
Species	1990-1995	1995-2000	2000-2005
Pw	-	-	-
Pr	-	-	-
Pj	115.0	152.2	63.5
Sp	788.3	1,051.9	975.7
Bf	14.8	33.9	19.9
C	0.6	0.3	3.3
La			1.7
Po	75.5	147.9	260.2
Bw	-	0.7	0.8
Oh	-	0.2	0.0
Total Actual Volumes	994.0	1,387.0	1,325.0



Source: planned: TMPM Table 4.18.1, FMPM Table FMP-21
actual TMPM Table 4.3.1, FMPM RPFO-4, annual reports

Note: Po volumes for 1990-1995 include Bw volumes (volume not available by species)

Note: 2004-2005 actuals were estimated using revised Trees data provided by MNR August, 2005 and do not include all additional volume that was hauled since April 1, 2005 under an extension to the authority to haul.

During the 1995-2000 five-year planning term, Aspen was harvested by Malette Inc. to supply their oriented strand board plant in Timmins, despite a fire in 1997 and a labour strike. Columbia Forest Products and Excel Forest Products, who marketed aspen to Grant Forest Products in Englehart. In all instances, the utilization of aspen was dependent on the requirements of the hardwood industry

2.3.3 The 2000-2005 Five-Year Planning Term

Current estimates for the 2000-2005 five-year planning term show that all allocated blocks were harvested while the actual volumes for all species were 73% of planned levels.

The actual volume for SPF was 86% of planned harvest volume.

This shortfall in SPF volumes is, for the most part, attributed to the fact that actual harvest area was approximately 9% less than planned due to unplanned bypass. Unplanned bypass occurs when timber is shown as merchantable on the Forest Resource Inventory (FRI), but in fact is either too small in diameter, too scattered to economically harvest, or was incorrectly identified in terms of age, species, size or quality. Some bypass will mature and generally support potential future harvest areas.

The shortfall in SPF volumes for the 2000-2005 five-year planning term can also be attributed to the condition of specific operating areas, in particular the 1850 Burn, which was beginning to breakup as a result of over maturity. Much of the wood harvested during the five-year term was a balance of mature and over-mature timber. Balancing the age class distribution continues to be a critical component of providing an uninterrupted flow of wood even at the cost of lower expected yields.

The actual volumes of delivered conifer volume, annualized over a four-year period (2000-2004), for mills that derive part or all of their fibre supply from the Gordon Cosens Forest were as follows:

- Kapuskasing Sawmill received an annualized SPF volume of 558,997 cubic metres between 2000 and 2004 (75% of commitment).
- Excel Forest Products received an annualized SPF volume of 241,848 cubic metres between 2000 and 2004 (201% of commitment).
- Tembec Hearst Sawmill received an annualized SPF volume of 245,174 cubic metres between 2000 and 2004 (151% of commitment).
- Tembec Timmins Sawmill received an annualized SPF volume of 81,496 cubic metres between 2000 and 2004 (68% of commitment).
- Lecours Lumber Co. Limited received an annualized SPF volume of 23,319 cubic metres between 2000 and 2004 (39% of commitment). It should be noted that Lecours Lumber concentrated their harvesting activities during the last year of the 2000-2005 five-year planning term, as a result, much of their volume is not represented in this report. Lecours depleted their entire allocation during this planning term.
- St. Mary's Paper received an annualized SPF volume of 9,745 cubic metres between 2000 and 2004 (65% of commitment). It should be noted that Synco Timber Limited, which provides volume to St. Mary's Paper, also concentrated their harvest activities during the last year of the 2000-2005 five-year planning term. St Mary's depleted their entire allocation during this planning term.
- Cayouette Cabinets received an annualized Conifer volume of 1,165 cubic metres between 2000 and 2004 (65% of commitment).

It should be noted that the Sustainable Forest License for the GCF requires that Spruce Falls shall make available to local area sawmills, for sawlog/chip exchange or direct sale, approximately 20% of the Company's annual conifer harvest of 750,000 cubic metres. This is the reason Excel Forest Products and Tembec Hearst Sawmill received more than 100% of their commitments.

During the five-year term, the actual harvest volume for cedar was only 13% of planned. The shortfall in cedar volumes is attributed to fluctuating markets, accessibility, and operating capacity. It is expected that cedar utilization will increase during the 2005-2010 five-year planning term.

The actual volumes of delivered hardwood volume, annualized over a four-year period (2000-2004), for mills relying on the Gordon Cosens Forest for wood supply were the following:

- Columbia Forest Products received an annualized hardwood volume of 44,298 cubic metres between 2000 and 2004 (76% of commitment).
- Norbord Ltd. received an annualized hardwood volume of 3,324 cubic metres between 2000 and 2004 (61% of commitment).
- Grant Forest Products Timmins received an annualized hardwood volume of 135,580 cubic metres between 2000 and 2004 (82% of forecast levels).
- Grant Forest Products Englehart received an annualized hardwood volume of 13,585 cubic metres between 2000 and 2004 (7% of forecast levels).

Utilization of hardwood species during this term increased by 75% over the 1995-2000 five-year planning term, and by 344% over the 1990-1995 five-year planning term. It is anticipated that aspen utilization will continue to increase during the 2005-2010 five-year planning term.

Overall, the actual harvest volume of hardwood during this period was 51% of planned. Much of the harvest during the 2000-2005 five-year planning period occurred in areas that experienced aspen decline and successive outbreaks of forest tent caterpillar since the year 2000. These events caused severe damage and negatively impacted many of the aspen stands that were planned for harvest during the five-year planning term.

2.4 Summary of Planned and Actual Harvest Area

Table 4 compares the planned versus actual harvest area, on an annualized basis, for the 1990-1995, 1995-2000, and 2000-2005 five-year planning terms. Data on planned harvest levels was obtained from TMP Table 4.15 and FMP Table 18. Information on actual harvest area was obtained from TMP Table 4.1, FMP Table RPFO-2, and annual reports. The actual harvest area for 2004-2005 has been estimated using the most current AWS and depletion information.

2.4.1 The 1990-1995 Five-Year Planning Term

During the 1990-1995 five-year planning term the actual harvest area represented 56% of planned. The factors contributing to the differences between the planned area depletion by established Licensees and actual area depletion levels were:

- Pressure on conifer operators to initially utilize allocations from other sources and private holdings prior to harvesting areas allocated for the 1990-2010 TMP (to avoid losing these allocations to other companies).
- Some of the conifer allocations were situated quite a distance from the mills (closer allocations on other units were more attractive).

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Table 4 - Summary of Planned & Actual Depletion Area

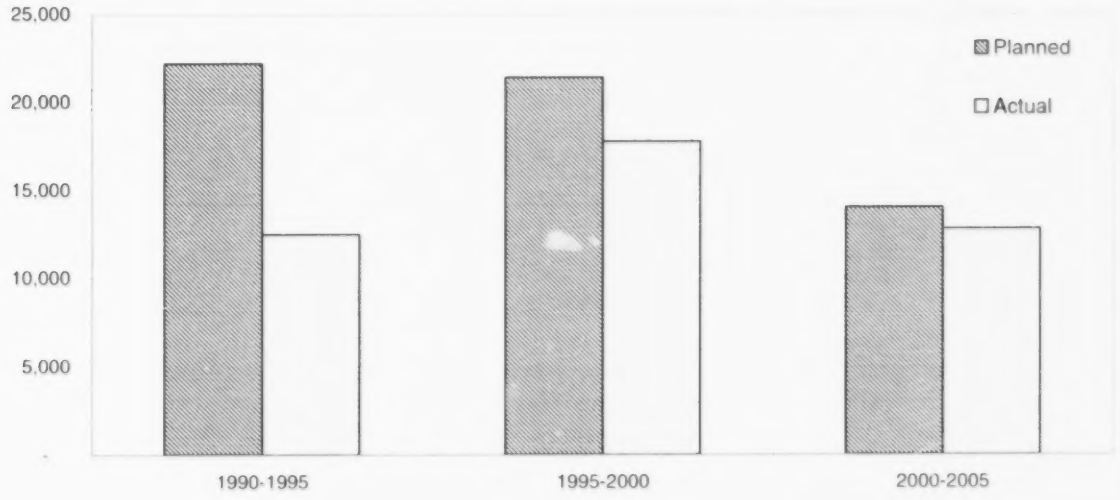
Past and Current Plans

MU: **Gordon Cosens Forest**

Area is Annualized for the indicated 5 year period

Planned Annual Harvest Area				Actual Depletion Area					
	Area in hectares			Area in hectares					
	Past Plans		Current	Past Plans				Current	
Plan Term				1990-1995		1995-2000		2000-2005	
Forest Unit	1990-1995	1995-2000	2000-2005	Harvest	Natural	Harvest	Natural	Harvest	Natural
U	11,890	11,514		7,507		9,802			
L-SF	6,156	5,917		3,253		5,104			
L-SWP	1,917	1,977		728		1,457			
P	919	938		598		682			
N-M	1,291	1,031		389		714			
Pn1			437					454	
Upc			3,095					3,020	
Hwd			1,485					1,322	
Lsf			3,827					3,426	
Lswp			1,181					1,015	
Ltn			216					157	
Upd			274					245	
Upm			3,486					3,156	
Total Area	22,173	21,377	14,001	12,475	-	17,759	-	12,795	136

Planned vs. Actual Harvest Area



Source: planned: TMPM Table 4.15, FMPM Table FMP-18 (Harvest area only, excluding bypass & reserve)
actual: TMPM Table 4.1, FMPM Table RPFO-2, annual reports

Note: Actual harvest taken from appropriate Annua Reports, but estimated for 2004-2005

Note: Unplanned bypass 2000-2005 not included in above figures (Actual)

- The north part of the unit was to have been accessed through a joint effort by Ontario Hydro and other forest operators. Changes in Ontario Hydro's scheduling necessitated concentrating their efforts on other priorities and as a result forest operators were not able to absorb the increased road construction costs. This caused the access to the northern part of the unit to be delayed.
- The low percentage of conifer sawlog material in some of the allocations made it less attractive for operators to harvest due to difficulties in finding markets.

2.4.2 The 1995-2000 Five-Year Planning Term

The timber harvested during the five-year term was a balance of over-mature timber and mature timber, and comprised an area of 88,795 hectares, which represents 83% of planned. During the preparation of the 1995-2015 FMP, bypass was anticipated to be 8.7 percent of the harvest allocation. During the five-year term of the plan, actual bypass was 19,885 hectares or 17 percent of the actual harvest area, an increase of approximately 8%. This increase in bypass was attributed to the discovery of large areas of blow down and small diameter wood that was deemed uneconomical to harvest. Unplanned bypass area and harvest area comprised approximately 93% of planned harvest area.

2.4.3 The 2000-2005 Five-Year Planning Term

During the 2000-2005 five-year planning term, actual harvest area was approximately 8.6 % lower than planned due to higher than anticipated unplanned bypass levels (approximately 8% of harvest area). During this term, all allocated blocks were harvested, with the exception of 135 hectares within block H68, which contained small diameter timber and rugged inoperable terrain.

All forest units except for Lowland transition exhibited an actual depletion that was greater than 90% of planned. The lowland transition forest unit showed that actual harvest area was 73% of planned. This trend corresponds well with the incidence of higher unplanned bypass on these sites, which are typically marginal and characterized by smaller diameter wood. A more complete analysis of the extent of unplanned bypass is impossible at this time, since the 2004-2005 depletion updates are not yet available at the time this trend analysis was prepared.

2.5 Summary of Managed Productive Forest by Forest Unit

Table 5 provides a summary by forest unit of the managed Crown productive forest for the 1990-1995, 1995-2000 and 2000-2005 five-year planning terms. The source of information was TMP Table 4.13.1, and FMP Table 9.

Although the Forest Unit composition on the GCF has remained stable during the past three planning terms, the forest has evolved over the past 150 years. Forest composition and structure have been modified over time by natural disturbances (i.e. wildfire, blowdown, and insect infestations) and forest management activities. Pre-settlement conditions in the Clay-Belt were heavily influenced by fire disturbance patterns and regimes. Although the GCF is a fire origin forest, fire suppression has effectively removed the element of fire from the forest since the 1920's and 1930's. Forest composition and structure have since been influenced by forest management activities, and insect infestations.

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Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (TMP 4.13.1) for 1990-1995

MU: Gordon Cosens Forest

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
U	0-5						108,900	0
	6-20						88,567	848,474
	21-40						85,408	4,355,808
	41-60						52,808	5,233,932
	61-80						75,864	12,289,320
	81-100						237,799	39,639,418
	101-120						28,154	4,904,088
	121-140						166,495	21,477,855
	141-160						754	77,662
	161-180						102	0
	181-200						211	0
	Subtotal	0	0	0	0		775,115	88,329,369
U-SE	0-5						34,188	0
	6-20						11,994	47,976
	21-40						53,931	1,601,730
	41-60						23,002	1,702,148
	61-80						11,427	1,234,116
	81-100						51,885	6,693,165
	101-120						11,524	1,940,312
	121-140						168,808	22,631,266
	141-160						66	8,418
	161-180						18	0
	181-200						5	0
	Subtotal	0	0	0	0		886,572	35,910,155
U-SWP	0-5						15,268	0
	6-20						1,078	11,858
	21-40						13,909	256,671
	41-60						6,184	215,740
	61-80						2,478	135,088
	81-100						4,602	384,354
	101-120						1,986	169,076
	121-140						63,756	5,291,256
	141-160						112	8,848
	161-180						8	0
	181-200						64	0
	Subtotal	0	0	0	0		108,883	6,442,887
P	0-5						179	0
	6-20						89	1,098
	21-40						2,989	131,984
	41-60						194	19,012
	61-80						14,646	2,431,236
	81-100						10,238	1,781,412
	101-120						3,047	513,841
	121-140						3,102	267,178
	141-160						1	59
	161-180						94	0
	181-200						19	0
	Subtotal	0	0	0	0		34,423	4,945,189
N-M	0-5						205	0
	6-20						69	276
	21-40						101	1,010
	41-60						108	1,620
	61-80						683	12,294
	81-100						6,161	147,864
	101-120						2,155	62,495
	121-140						62,062	1,675,674
	141-160						31	775
	161-180						14	0
	181-200						12	0
	Subtotal	0	0	0	0		71,601	1,902,108
	Total	40,827	0	0	0	0	1,376,394	137,225,709
	Actual Totals	40,827					1,350,935	

Available column shows production forest land base derived from Table TMP 4.13.1

Breakdown not available for protection forest by forest unit.

Available landbase includes 25,459 ha. of Crown Land Exclusions

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Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (TMP 4.13.1) for 1995-2000

MU: Gordon Cosens Forest

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
U	0-5						47.482	0
	6-20						122.489	2,694,758
	21-40						90,066	4,503,366
	41-60						65,761	6,510,339
	61-80						65,018	10,532,916
	81-100						155,432	28,288,624
	101-120						62,294	9,967,040
	121-140						23,149	5,986,221
	141-160						122,516	12,619,148
	161-180						79	0
	181-200						262	0
	Subtotal	0	0	0	0		754,547	78,102,412
USE	0-5						12,287	0
	6-20						66,067	264,268
	21-40						54,656	1,630,680
	41-60						29,952	2,216,448
	61-80						14,363	1,551,204
	81-100						46,241	5,084,060
	101-120						8,304	1,145,952
	121-140						11,692	1,554,936
	141-160						139,769	17,890,048
	161-180						20	0
	181-200						75	0
	Subtotal	0	0	0	0		383,430	32,727,496
USWP	0-5						3,564	0
	6-20						13,881	152,691
	21-40						10,947	207,993
	41-60						7,974	279,090
	61-80						3,440	196,080
	81-100						4,791	368,907
	101-120						1,224	105,264
	121-140						2,302	191,066
	141-160						55,520	4,386,080
	161-180						2	0
	181-200						64	0
	Subtotal	0	0	0	0		103,709	5,887,171
P	0-5						1,764	0
	6-20						3,054	46,648
	21-40						2,212	97,328
	41-60						983	96,334
	61-80						8,119	1,347,754
	81-100						13,267	2,308,458
	101-120						1,250	128,750
	121-140						1,236	110,004
	141-160						1,855	169,445
	161-180						49	0
	181-200						10	0
	Subtotal	0	0	0	0		33,789	4,234,721
NM	0-5						2,723	0
	6-20						3,493	13,972
	21-40						466	4,664
	41-60						283	4,245
	61-80						2,498	44,964
	81-100						10,238	245,712
	101-120						4,460	129,340
	121-140						7,375	199,125
	141-160						85,226	2,130,650
	161-180						36	0
	181-200						36	0
	Subtotal	0	0	0	0		116,834	2,772,668
	Total	0	0	0	0	0	1,392,219	123,314,468
	Actual Totals	40,678					1,351,535	

Available column shows productive forest land base derived from Table TMP 4.13.1
Breakdown not available for protection forest by forest unit

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Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (FMP-9) for 2000-2005

MU: Gordon Cosens Forest

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m³)	(ha)	(m³)		(ha)	(m³)
Jack Pine	B&S						6.792	0
	1-20			5	99		3.816	45.792
	21-40						1.525	67.100
	41-60			8	294		3.013	295.274
	61-80	22	3.652	65	10.790		7.503	1.245.498
	81-100			88			5.729	998.846
	101-120			86	8.858		3.048	313.120
	121-140						1.224	108.936
	141+			7	415		1.465	86.435
	Forest Unit Subtotal	22	3.652	208	20.451	0	34.113	3.159.001
Lowland Spruce Flat	B&S						90.681	0
	1-20	1.506	6.024	53	212		43.118	172.472
	21-40	29	870	91	2.730		61.429	1.842.870
	41-60	230	17.686	84	6.216		48.538	3.591.812
	61-80	2.756	297.648	30	3.240		29.259	3.159.972
	81-100	5.589	720.981	205	26.445		23.858	3.077.682
	101-120	2.116	292.008	65	8.970		28.435	3.924.030
	121-140	4.930	660.620	45	6.030		26.357	3.531.838
	141+	15.563	1.992.064	312	39.936		81.987	10.494.336
	Forest Unit Subtotal	32.728	3.987.901	885	93.779	0	433.662	29.795.012
Lowland Spruce Swamp	B&S						11.811	0
	1-20	512	5.632	3	33		8.413	92.543
	21-40	70	1.330	20	380		15.476	294.044
	41-60	27	945	45	1.575		15.888	556.080
	61-80	883	50.331	108	6.156		8.543	486.951
	81-100	1.272	97.944				3.658	281.666
	101-120	291	25.026	3	258		3.985	342.710
	121-140	1.080	89.640	17	1.411		4.389	364.287
	141+	5.783	456.857	192	15.168		37.821	2.987.859
	Forest Unit Subtotal	9.918	727.705	388	24.981	0	109.984	5.406.140
Lowland Transition	B&S						10.707	0
	1-20	252	1.008	21	84		553	2.212
	21-40	1	10	31	310		450	4.500
	41-60		0	46	690		647	9.705
	61-80	207	3.726	9	162		1.124	20.232
	81-100	145	3.480	61	1.464		2.508	60.192
	101-120	93	2.697	238	6.902		6.712	194.648
	121-140	210	5.670	9	243		6.198	167.346
	141+	2.445	61.125	932	23.300		53.380	1.334.500
	Forest Unit Subtotal	3.353	77.716	1.347	33.155	0	82.275	1.793.335

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Table 5 - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (FMP-9) for 2000-2005

MU: Gordon Cosens Forest

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m³)	(ha)	(m³)		(ha)	(m³)
Upland Conifer	B&S						58,484	0
	1-20	79	2,133	124	3,348		56,590	1,527,930
	21-40			256	13,250		50,046	2,652,438
	41-60	59		135	13,509		40,116	4,011,600
	61-80	219	33,069	165	24,915		28,466	4,298,366
	81-100	23	4,801	235	43,945		34,416	6,435,792
	101-120	176	33,792	80	15,360		23,059	4,427,328
	121-140	46		109	16,895		11,099	1,720,345
	141+	74	9,102	1,306	160,638		36,462	4,484,826
	Forest Unit Subtotal	676	82,897	2,404	291,851	0	338,738	29,558,625
Upland Mixed	B&S						25,320	0
	1-20	5	145	77	2,233		42,239	1,224,931
	21-40	128	7,808	191	11,651		79,352	4,840,472
	41-60	472	41,064	800	69,600		59,557	5,181,459
	61-80	214	35,952	468	78,624		42,699	7,171,920
	81-100	136	28,152	655	135,585		27,099	5,609,493
	101-120	51	9,843	1,214	234,302		33,019	6,370,939
	121-140	6		541	83,314		6,483	982,982
	141+	62	8,618	773	107,447		19,391	2,695,349
	Forest Unit Subtotal	1,074	131,582	4,719	722,756	0	335,041	34,077,536
Upland Depleted	B&S						5,570	0
	1-20						444	2,664
	21-40						32	480
	41-60			34	1,836		34	1,836
	61-80						221	33,471
	81-100							
	101-120	69	4,950	52	3,900		17,753	1,331,475
	121-140						1,505	78,260
	141+			132	4,488		15,276	519,384
	Forest Unit Subtotal	69	4,950	218	10,224	0	40,835	1,967,470
Hardwood	B&S						35,626	0
	1-20	10	110	84	924		1,868	20,548
	21-40			8	312		2,505	97,695
	41-60	234	25,740	281	30,910		12,998	1,429,780
	61-80	61	10,248	315	52,920		23,533	3,953,544
	81-100			135	20,385		8,557	1,292,107
	101-120	10	950	956	90,820		37,876	3,598,220
	121-140			99	13,042		3,255	253,890
	141+	130	6,110	37	1,739		836	39,292
	Forest Unit Subtotal	445	43,158	1,855	201,052	0	127,054	10,685,076
	Total	48,282	5,059,061	12,024	1,398,249	0	1,501,702	116,442,195

Source:

TMPM Table 4.8.2, 4.9

FMPM Table FMP-9

The pre-settlement forest was of fire origin that has evolved over thousands of years. The origin of the present mature and over-mature forest has evolved from several very large forest fires that occurred prior in 1850 (and earlier), 1895 and 1905. These wildfires covered extensive areas of the forest and resulted in vast areas of even-aged forest. The type of forest that regenerated following wildfire was influenced by the season of the fire, site type and species composition.

Insect infestations (primarily spruce budworm) have been a major cause of change on the forest. In particular, a severe spruce budworm infestation during the mid- to late 1970's and early 1980's resulted in a significant loss of conifer throughout the forest. The most notable losses have occurred in the southwest portion of the limits.

2.6 Summary of Renewal, Tending and Protection Operations

Table 6 provides a comparison of renewal, tending, and protection operations for the 1990-1995, 1995-2000, and 2000-2005 five-year planning terms. The sources of information for planned areas are TMP Table 4.19 and FMP Table 25. The sources of information for actual areas are TMP Table 4.4, FMP RPFO-7, and applicable annual reports. It should be noted that the 2004-2005 annual report was not available during the completion of this report. The most current information was used to provide accurate estimates of the renewal, tending and protection activities during the 2004-2005 period.

Renewal forecasts established in past and current plans are estimates. The specific renewal treatment that occurred on each site was established immediately prior to and after the harvest using various means (ground visits, local knowledge, survey data, etc).

Mortality from the 1976 to 1986 spruce budworm infestation continued to be an issue with respect to harvest and renewal. Areas of high mortality in Conking, Hayward and Hook townships formed part of the harvest area for Lecours Lumber and Tembec Industries Inc – Hearst. A number of these areas were renewed with funding from the Forestry Futures Trust Fund during the 1995-2000 and 2000-2005 five-year planning terms.

2.6.1 Natural and Artificial Regeneration

Many areas of the GCF are characterized by large areas of Spruce-dominated lowlands with abundant seedbed or advanced regeneration. Because of this, specialized techniques which are described below, have been developed to harvest and regenerate these areas. Wide, high-floatation tires were initially developed on this forest to assist in reducing site disturbance thus providing increased protection to available seedbed.

Natural regeneration on the Gordon Cosens Forest includes the following treatments:

GST	-	Group Seed Tree Harvesting
HARP	-	Harvest and Regeneration Protection

In addition to these natural regeneration treatments, Careful Logging Around Advance Growth (CLAGG), has occurred on the GCF during the past three planning terms, on all sites where natural regeneration existed. This is an operational practice used by all operators on the GCF. Specific training in the application of this treatment is provided to operators.

2005 Independent Forest Audit

Table 6 - SUMMARY REPORT OF RENEWAL, TENDING AND PROTECTION OPERATIONS (RPFO-7)

MU: Gordon Cosens Forest

	Area Summary of all Forest Units (ha)					
	1990-1995		1995-2000		2000-2005	
	Planned	Actual	Planned	Actual	Planned	Actual
Renewal						
Regeneration						
Uneven-Aged Management						
Selection Cut - Harvest	0	0	0	0	0	0
Total Uneven-Aged Management	0	0	0	0	0	0
Even-Aged Management						
Natural Regeneration						
Clearcut	10,883	25,424	39,599	34,108	24,315	20,326
Strip Cut						
Seed Tree Cut/H.A.R.P.	3,131	1,507	33,099	34,549	20,783	16,731
Uniform Shelterwood Seed Cut						
Subtotal Natural	14,014	27,021	72,698	68,657	45,098	37,057
Artificial Regeneration						
Planting	34,849	21,971	20,309	24,368	20,285	25,049
Seeding direct	6,036	5,307	2,750	1,710	2,500	3,354
with site preparation			500			
HARO	14,710	10,171				
Scarification						
Subtotal Artificial	55,595	37,449	23,559	26,078	22,785	28,403
Total Even-Aged Management	69,609	64,470	96,257	94,735	67,883	65,460
Total Regeneration	69,609	64,470	96,257	94,735	67,883	65,460
Site Preparation						
Mechanical	27,042	14,521	8,750	12,585	10,000	4,575
Chemical	802	2,908		272	2,500	1,729
Prescribed Burn	5,981	901	1,500		2,500	0
Slash Pile Burning		18		198	3,000	7,477
Total Site Preparation	33,825	17,748	10,250	13,055	18,000	13,781
Tending						
Cleaning						
manual					500	
chemical - ground	5	1			500	111
aerial	59,921	48,832	40,727	37,506	46,000	33,964
mechanical					500	
prescribed burn						
Spacing, pre-commercial thinning, improvement cutting						
even-aged						209
uneven-aged						
Cultivation						
Total Tending	59,926	48,833	40,727	37,506	47,500	34,284
Protection (Insect Pest Control)						
accelerated harvest						
salvage						
manual protection						
ground insecticide						
aerial insecticide						
Total Protection		0		0		0

Source:

planned: TMPM Table 4.19, FMPM Table FMP-25

actual: TMPM Table 4.4, FMPM Table RPFO-7, annual reports

Note: 2004-2005 actuals are estimates, as the 2004-2005 Annual Report has not been submitted (due Nov. 15, 2005).

During the 1990-1995 five-year planning term, natural regeneration was used on 27,021 hectares, which exceed planned levels by 92%. Artificial regeneration was employed on 37,449 hectares, which corresponds to 67.4 % of planned. Overall, actual regeneration levels were 93% of planned. The difference between planned and actual was due to site conditions encountered during harvest. Actual harvest depletion areas were also 8.6% lower than planned during that period. A total of 62,375 hectares were depleted during the term, while 64,470 hectares were regenerated. It should be noted that some of the areas that were treated during the first year of the 2000-2005 planning term were actually depleted in 1989-1990.

During the 1995-2000 five-year planning term, natural regeneration was employed on 68,657 hectares, which translates to 94.4% of planned. Artificial regeneration was employed on 26,078 hectares, which exceeded planned levels by 11%. Overall, actual regeneration levels were 98% of planned.

A total of 88,795 hectares was depleted during the 1995-2000 five-year planning term, while 94,735 hectares were regenerated. The higher than expected level of artificial regeneration was due to increased planting sites and the treatment of unplanned spruce budworm depleted areas.

During the 2000-2005 five-year planning term, natural regeneration was utilized on 37,057 hectares, which was 82% of planned. Artificial regeneration was employed on 28,403 hectares, which exceeded planned levels by 25%. This was due to the increased availability of good planting areas. Overall, actual regeneration levels were 96% of planned. It should be noted that due to unplanned bypass, only 91% of available harvest area was depleted during this period, which explains the shortfall in planned versus actual regeneration. During this term, 64,655 hectares were depleted, while 65,460 hectares were regenerated. Some of the areas that were artificially regenerated during the first year of the 2000-2005 planning term were actually depleted in 1999-2000.

During the 2000-2005 five-year planning term, GST and H.A.R.P. use was 80% of planned. This was a result of adjustments made during harvest operations to ensure the most appropriate regeneration method was applied given the stand and site conditions encountered during the time of harvest. In most instances, conditions favored the application of H.A.R.P. over GST.

Direct seeding was 34% higher than projected levels of 2,500 hectares proposed for the 2000-2005 five-year planning term. Prediction of the amount of aerial seeding required is difficult as it is entirely dependent on sites being harvested with suitable seedbeds. On some HARP and GST treatment areas, the application of aerial seeding is not required.

2.6.2 Site Preparation

During the 1990-1995 five-year planning term, mechanical site preparation, chemical site preparation, prescribed burn, and slash pile burning were all used. Actual mechanical site preparation was 54% of planned. Actual chemical site preparation was 288% higher than planned. Actual prescribed burns accounted for only 15% of planned levels. Although slash pile burning was not planned during this term, it was completed on 18 hectares. Overall, site preparation levels were 52% of planned. This difference is mostly due to the actual harvest area being 56% of planned during this term.

During the 1995-2000 five-year planning term, mechanical site preparation exceeded the planned 8,750 hectares by 3,833 hectares (143%). This variance was due to the increased availability of

good planting sites and the treatment of unplanned spruce budworm depleted areas under the Forestry Futures Trust Fund. Other site preparation activities that occurred, but were not planned during the five-year term, included 273 hectares of chemical site preparation and 198 hectares of slash pile burning. No prescribed burning occurred during this term.

During the 2000-2005 five-year planning term, actual mechanical site preparation was used on 4,575 hectares, which was 46% of planned. This variance was due to a shift towards planting sites as-is and utilizing chemical site preparation more frequently than in past terms, as it is an effective means of controlling woody competition while minimizing site disturbance. Mechanical site preparation is heavily site dependent, which has also limited its use. Other site preparation activities during the five-year term included 1,729 hectares of chemically site preparation (69% of planned) and 7,477 hectares of slash pile burning (249% of planned). The increase in slash pile burning was in direct response to the findings and recommendations of the 2000 Internal Forest Audit (IFA).

2.6.3 Tending

During the 1990-1995 five-year planning term, tending activities occurred on 48,833 hectares, which was 81% of planned. Only one hectare was treated from the ground, while the remaining areas were treated aerially.

During the 1995-2000 five-year planning term, tending activities occurred on 37,506 hectares, which was 92% of planned. All tending was completed aerially during this period. Tending activities during this term were reduced by 23% compared to the 1990-1995 five-year planning term. This reduction coincided with a reduction in artificial regeneration and an increase in natural regeneration levels during the 1995-2000 five-year planning term. It should be noted that naturally regenerated sites on the GCF are normally tended between 7 and 10 years following harvest, as opposed to one to two years following artificial regeneration such as tree-planting.

For the 2000-2005 five-year planning term, tending activities occurred on 32,806 hectares, which was 70% of planned. The shortfall in tending levels is not considered an underachievement of a target. Tending forecasts established in the 2000-2020 FMP were only estimates and the need for tending were established annually through field inspections and local knowledge. In addition, weather related issues prevented the completion of two annual programs in 2003 and 2004. This backlog is planned to be treated during the 2005 tending program.

A total of 209 hectares received a pre-commercial thinning treatment during the 2000-2005 five-year planning term. These areas were characterized by high stem density and good growth patterns. These areas will likely be candidates for other intensive forest management activities (ie. commercial thinning) in the future. No pre-commercial thinning was planned during this term.

No areas were treated with chemical or biological pest control agents during the 1990-1995, 1995-2000, and 2000-2005 five-year planning terms.

Tree improvement work done on the Gordon Cosens Forest for the 2000-2005 five-year planning term consisted of growing improved stock and cone collection. Improved stock was planted in 2005 within areas of the intensive forest management (NEBIE) trials. Additionally, improved black spruce stock is scheduled for planting during the spring 2006. In addition to work done specifically on the Gordon Cosens Forest, tree improvement work has continued at the Bonner Tree Improvement Centre.

A total of 242 hectolitres of seed was collected during the five-year term of the plan. This was comprised mainly of black spruce and white spruce but also jack pine and a small amount of white pine.

2.7 Summary of Harvest Area Successfully Regenerated

Table 7 provides a summary of areas harvested during the 1990-1995 five-year planning term that were surveyed for regeneration success and declared Free-to-Grow during the 2000-2005 five-year planning term. The sources of information for harvest areas are TMP Table 4.1, and FMP PRFO-2. Survey results were taken from digital GIS records of the area harvested during the 1990-1995 five-year planning term.

Free-to-grow (FTG) assessments are normally conducted on the 11th year following depletion. Some areas, particularly the upland planted areas would be ready for assessment in the 5 to 7 year range, however, lowland natural regenerating areas typically require longer periods to attain the required height requirements to be declared FTG. As a result, and to maintain efficiencies in returning to the same assessment area numerous times, the assessment occurs in the 11th year. This assessment strategy allows for the assessment of entire harvest areas at one time, rather than numerous return trips.

A total of 62,375 hectares were depleted during the 1990-1995 five-year planning term. Of this, 58,898 hectares were surveyed and 58,728 hectares were declared Free-to-Grow (99.7%). This represents a significant success in regenerating the sites depleted between 1990 and 1995.

A total of 170 hectares of the areas depleted between 1990-1995 have been identified by the assessor as not being sufficiently regenerated (NSR). The areas that did not meet FTG standards may require tending or additional time to meet height requirements. These areas will be reassessed at a later date, as prescribed by the assessor during the aerial survey. Further regeneration treatments may be used as required on these sites to ensure that are sufficiently regenerated.

A total of 3,477 hectares of the area depleted during the 1990-1995 five-year planning term were not surveyed. The reasons for this include:

- Stands had not reached the eleventh year following depletion (ie. depletions from 1995).
- Small stands that will be flown when larger adjacent areas are flown. This maintains operational efficiencies.
- Small slivers that are remnants of inventory updates.
- Areas that are considered non-forested, or historical barren and scattered areas. These areas are flown coincidently with adjacent productive forest stands to ensure the inventory information is updated.

Historically, the general approach to renewal of the forest on the GCF has been to survey the area using on-site supervisors during harvest, as well as post-harvest regeneration assessment inspections. A FTG survey is conducted on the eleventh year following the depletion event. Renewal treatments have largely been aimed at increasing the component of conifer on all but the hardwood sites, which are expected to regenerate to an aspen or birch dominated stand. Increasingly, mixed-wood management is being implemented and practices are evolving over time to ensure that mixed woods remain on site.

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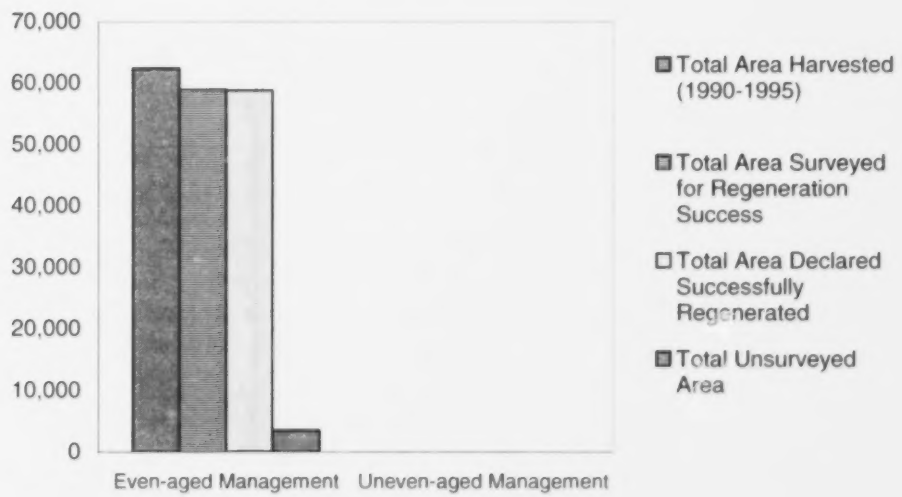
Table 7 - Harvested Area Successfully Regenerated - Summary of All Forest Units

MU: Gordon Cosens Forest

	AREA IN HECTARES (All Forest Units Combined)	AREA IN HECTARES (All Forest Units Combined)
	Even-aged Management	Uneven-aged Management
Total Area Harvested (1990-1995)	62,375	-
Total Area Surveyed for Regeneration Success	58,898	-
Total Unsurveyed Area	3,477	-
Total Area Declared Successfully Regenerated	58,728	-
Total Area Surveyed Not Successfully Regenerated		-
NSR	-	-
B&S	170	-
Not Available for Regen. (eg. Roads & landings)	-	-
Other	-	-
Percent of Area Surveyed Declared Successfully Regenerated	99.7%	



Source:
total area harvested: TMPM Table 4.1, FMPM Table RPFO-2, or annual reports
survey results: TMPM Table 4.7, FMPM Table RPFO-8, RPFO-9, silviculture records

3.0 Objective Achievement and Assessment of Sustainability

The success of the 2000–2025 FMP in achieving the sustainability of the Gordon Cosens Forest can only be measured with the available information. This report provides an indicator of trends in forest condition. Progress towards the objectives can be seen in the increase in the area of plantations, the effective use of HARP/CLAAG, the steadiness in the amount of area in the forest units over time, the continued socioeconomic benefits to the local and provincial economy, and the continued Free-to-Grow survey efforts that have led to a reduction in area that is barren and scattered (B&S) on the forest.

3.1 Harvest Objectives

a) "To provide for a continuous and predictable supply of wood resources, at a minimum cost to Spruce Falls mill now, and in perpetuity";
b) "To provide for a predictable supply of wood fibre, surplus to the Spruce Falls mill requirements, to other forest processing facilities";
c) "To provide the public and local entrepreneurs with opportunities to harvest fuelwood and other forest (wood fibre) resources.

The harvest objectives for the 2000-2020 FMP were met through harvesting in stands of specific composition and age class during this term, the offering of timber which was surplus to the needs of the Kapuskasing complexes to other local industry, and sawlog-chip exchanges which maximize the value derived from the timber. Opportunities were also provided throughout the five-year term for fuelwood harvest to the public and small entrepreneurs. Small entrepreneurs were also provided opportunities to harvest minor species such as white birch, cedar, and larch. In addition, amounts of conifer and balsam poplar were made available to the Tembec Industries Inc. Smooth Rock Falls Kraft mill.

3.2 Silvicultural Objective

"To ensure acceptable natural or artificial regeneration of all harvested and naturally depleted areas to achieve the desired future condition."

The silvicultural objective was met by employing effective renewal and tending treatments during this term. These comprised of extensive treatments such as HARP, CLAAG, GST, and aerial seeding in combination with more intensive renewal treatments such as tree planting and tending. Based on past assessments of regeneration success of the treatments applied during this planning period it is expected that this objective will continue to be met now and into the future.

Tembec Industries Inc. staff has successfully adapted their forest management activities in response to the sensitive nature and site conditions of the Northeastern Ontario Clay Belt. The renewal rates have consistently exceeded harvest levels.

Past audits on the GCF have described the extent and success of renewal on this forest as "striking" (1995-2000 IFA report), indicating that the tending methods are appropriate for the site conditions.

3.3 Forest Health Objective

"To contribute to the improvement of overall forest health."

During the current term, a specific strategy was put into place to harvest a certain portion of the forest stands that were depleted by the spruce budworm during the last major infestation (late 1970's through the early 1980's). A portion of these areas, which are described as second growth balsam fir stands exhibiting multi-aged characteristics, have been harvested during the current term and have been regenerated to a more budworm resistant forest. Planting white and black spruce together and encouraging mixed wood management on these sites will reduce the food trail that the budworm requires.

In addition, growing concern caused by forest tent caterpillar and poplar decline on the GCF during the 2000-2005 five-year planning term precipitated the formation of a regional committee to discuss the issue and recommend a strategy for action. Tembec Industries Inc. staff have been instrumental during this process and remain involved. A decision was made that an application of pesticides would not occur on these sites. Poplar decline and forest tent caterpillar areas were tracked aerially by OMNR during the 2000-2005 term. Opportunities for salvage operations have been considered on certain sites.

3.4 Forest Diversity Objectives

"To maintain the biological diversity of the Gordon Cosens Forest." Biological diversity is defined here as the variety of organisms and the ecological complexes in which they occur.

This objective was met through the continued implementation of the Biological Diversity Strategy for the Gordon Cosens Forest, which was initially prepared in November 1994 and has been modified somewhat to reflect the latest available literature on biodiversity. The underlying assumption of this approach is that all native species and ecological processes are more likely to be maintained if managed forests are made to resemble those forests created by natural disturbance agents such as fire, wind, insects, and disease. Forest Management Planning during this term was designed to mimic natural fire disturbance patterns (size, spatial distribution, etc).

In addition to the implementation of a landscape approach to managing for biodiversity, all applicable guidelines, including the Forest Management Guidelines for the Provision of Marten Habitat, was applied during this term.

3.5 Environmental Quality Objective

"To conduct timber management activities in a manner which minimizes and mitigates the impacts on environmental quality."

This objective was met through a variety of mechanisms. Continual improvement on a range of environmental quality issues through setting objectives and targets and implementing associated action plans on Spruce Falls' operations under its Environmental Management System, which is ISO 14001 registered. A number of procedures, internal keys and working instructions have also been introduced to assist in the continual improvement process. In addition, harvest schedules were developed based on consideration of site information and current science that utilized the most appropriate machinery to minimize impact on environmental quality. In addition, specific operational adjustments were made, including limiting operations to upland sites, seasonal operations (i.e. no harvest during break-up and freeze-up) and the use of high floatation equipment, to reduce site disturbance.

Achievement of this objective has been monitored through Tembec Industries Inc.'s forest compliance inspection program, which was established in 1997-98 and continues to this day.

3.6 Water Quality Objective

"To minimize the impacts on water quality and aquatic habitat within areas of harvest, renewal, tending and access operations."

Similarly to the Environmental Quality Objective, this objective was also met through a variety of mechanisms. This included on-going staff and operator training. Technological improvements in bridge and culvert installations, as well as applicable guidelines, ensure that our impact on the water quality is minimized. The Environmental Management System allows for effective tracking of objectives, targets and the implementation of associated action plans leading to continual improvement.

3.7 Integrated Resource Management Objective

"To minimize any negative impacts that forest management activities may have on other forest users and uses."

This objective was met through consultation with other users of the forest (e.g. tourist outfitters, trappers, first nations, etc.), negotiations with concerned parties and the general involvement of the local citizens' committee (LCC) and the public.

4.0 Conclusion

The trend analysis shows that plan objectives were met during the five-year term of the 2000-2005 Forest Management Plan. Tembec Forest Resource Management will continue moving forward in meeting or exceeding obligations, commitments, and innovation in a positive manner. New and ongoing initiatives include maintaining Forest Stewardship Council (FSC) certification, maintaining ISO 14001 certification, continued support and adherence to the OFIA Code of Forest Practices, and the Tembec's "Forever Green" Environmental Management Program Guiding Principles. Tembec Forest Resource Management's continued commitment to working with community groups is seen through involvement in the Regional Advisory Committee (RAC), the Local Citizens Committee (LCC) and other sub-committees of the LCC, the Roads Committee, and also the general public.

APPENDIX B – AUDIT TEAM MEMBERS AND QUALIFICATIONS

Craig Howard, R.P.F., CEA (SFM) – Lead Auditor

Education:	B.Sc. Forestry, University of New Brunswick, 1983.
Experience:	21 years experience in forestry, 9 years in private practice, 3 years in the OMNR.
Previous Audits:	12 Independent Forest Audits, 10 Sustainable Forest Initiative Verifications, 2 Forest Stewardship Council Assessments.

Mark Leschishin, R.P.F – Forester

Education:	B.Sc. Forestry, Lakehead University, 1978. Dip. For. Tech., 1974.
Experience:	26 years experience in forestry in Ontario.
Previous Audits:	9 Independent Forest Audits.

Tom Clark – Ecologist

Education:	M.Sc., H.B.Sc.
Experience:	Forest ecologist and biologist with 25 years experience in habitat ecology.
Previous Audits:	11 Independent Forest Audits, 13 Forest Stewardship Council Assessments.

Phil Shantz – Socio-economist

Education:	M.E.S, R.P.P.
Experience:	Registered professional planner with 13 years experience in forest auditing/certification, resource and socio-economics, land-use planning and public consultation.
Previous Audits:	10 Independent Forest Audits, 11 Forest Stewardship Council Assessments.

Brian Callaghan, R.P.F. – Forest Management Planning Analyst

Education:	B.Sc.F., University of Toronto, 1982.
Experience:	23 years experience in forestry in Ontario.
Previous Audits:	17 Independent Forest Audits, 4 Sustainable Forest Initiative Verifications, 3 Forest Stewardship Council Assessments.

Anne Hayes, M.P.M. – Secretariat

Education:	B.S. (Plant and Soil Biology); Master of Pest Management.
Experience:	Nine years experience as biologist in Ontario.
Previous Audits:	4 Independent Forest Audits, 2 Sustainable Forest Initiative Verifications, 1 Forest Stewardship Council Assessment.

APPENDIX C – INDEPENDENT FOREST AUDIT GUIDING PRINCIPLES

Commitment	Commitment is reflected in vision, mission and policy statements of the company. Vision and mission statements are intended to provide long-term guidance for the organization. Policy statements reflect how the organization's vision and mission will be achieved. These statements must be reflected in the day-to-day operations of the organization.
Public Participation	The process of sustainable forest planning, implementation and monitoring is conducted in an open consultative fashion, with input from all members of the planning team, Local Citizens Committee, native groups, and other parties with an interest in the operations of the forest unit.
Forest Management Planning	The forest management planning process involves the input of a number of individuals and groups to describe the current condition of the forest, the values and benefits to be obtained from the forest, the desired condition of the forest in the future, and the best methods to achieve that goal. Certain minimum standards and procedures have been established upon which all management units are evaluated.
Plan Implementation	Verification of the actual results of operations in the field compared to the planned operations is required to be able to assess achievement of the plan objectives and compliance with laws and regulations. In conjunction with the review of operations, the reporting tables are tested to ensure accurate results are reported.
Systems Support	System support concerns resources and activities needed to support plan implementation so as to achieve the desired objectives. Appropriate control, documentation and reporting procedures must be in place and operational. Planned action should occur at planned times, in planned places and to the planned degree.
Monitoring	The activities and the effects of these activities in achieving management objectives must be regularly measured and assessed. In particular, the indicators of achievement must be assessed and their effectiveness reviewed.
Achievement of Management Objectives & Forest Sustainability	Periodic assessments of the management of the forest unit operations and the forest unit must be made in order to determine whether forest sustainability and other management objectives are being achieved. This includes comparing the actual values of the predetermined indicators against the planned values and assessing the reasons for any significant deviations.
Contractual Obligations	The licensee must comply with the specific license requirements.

APPENDIX D – LIST OF ACRONYMS USED

ACOP – Annual Compliance Operating Plan
AOC – Area of Concern
AWS – Annual Work Schedule
B&S – Barren and Scattered
CFSA – Crown Forest Sustainability Act
CMU – Crown Management Unit
DFO – Department of Fisheries and Oceans
EMS – Environmental Management System
FIM – Forest Information Manual
FMA – Forest Management Area
FMP – Forest Management Plan
FMPM – Forest Management Planning Manual
FOIP – Forest Operations Inspection Program
FOP – Forest Operations Prescription
FRI – Forest Resource Inventory
FSC – Forest Stewardship Council
FTG – Free-to-Grow
GCF – Gordon Cosens Forest
GIS – Geographic Information System
GPS – Global Positioning System
HCVF – High Conservation Value Forest
IFA – Independent Forest Audit
IFAPP – Independent Forest Audit Process and Protocol
LCC – Local Citizens' Committee
MOA – Memorandum of Agreement
MOE – Ministry of the Environment
NDPE – Natural Disturbance Pattern Emulation
NEBIE – Natural disturbance, Extensive, Basic, Intensive, and Elite
NESMA – Northeast Seed Management Association
NRVIS – Natural Resources Values Information System
OLL – Ontario Living Legacy
OMNR – Ontario Ministry of Natural Resources
PSP – Permanent Sample Plot
RPFO – Report of Past Forest Operations
RSA – Resource Stewardship Agreement
SAR – Species at Risk
SEIM – Socio-Economic Impact Model
SEV – Statement of Environmental Values
SFL – Sustainable Forest License
SFMM – Strategic Forest Management Model

SGR – Silvicultural Ground Rule
STRONG – Saving the Regions of Northern Ontario Group
TMP – Timber Management Plan
TMPM – Timber Management Planning Manual

APPENDIX E – SUMMARY OF INPUT TO AUDIT PROCESS

The auditors received input from interviews, document reviews and direct observations. This appendix summarizes input received through interviews and document review.

During the course of this audit, input was received from a number of sources: the public, the LCC, Aboriginal communities, overlapping licensees with operations on the GCF, OMNR staff and Tembec staff. Various means were used to solicit input, including formal interviews, public open houses, and a direct mailing.

General Public: A mailing of a questionnaire/survey to 605 members of the public yielded 25 responses. This was a medium response rate in comparison to most other audits with which the audit team has been involved. The returned surveys expressed mixed opinion regarding forest management practices on the GCF. When asked to describe any poor management practices that may have been observed on the GCF, a number of respondents mentioned poor utilization practices as concerns. Concern for other users of the Forest (e.g., those hunting and fishing) were raised.

Notices informing the public about the scheduled public meetings and inviting their participation in the IFA process appeared in the local French and English newspapers.

A public meeting was held on October 4, 2005, in Kapuskasing. Fifteen individuals attended the meeting. Issues brought out during the meetings dealt with the sustainability of the Forest, harvesting practices and public use of the Forest for non-timber purposes.

Local Citizens' Committee: The audit team interviewed 17 members of the Gordon Cosens LCC. The Gordon Cosens LCC participated actively in the audit by sending a representative to accompany the audit team on all days during its field inspections. The audit team attended an LCC meeting on October 5, 2005. Issues brought forward by the LCC are discussed largely in Section 3.2.1 of this report.

Aboriginal Communities: Letters were sent to 12 First Nations communities. An auditor visited the Moose Cree First Nation. All other communities were contacted initially by phone. Where possible, face-to-face interviews were arranged.

Input from the Aboriginal communities is discussed largely in Section 3.2.3 of this report.

Overlapping Licensees: All overlapping licensees with significant operations on the GCF were contacted and interviewed as part of the audit. Audit team members visited sample locations in the field. The licensees were generally content with their relations with Tembec on the GCF, but several suggested that completed MOAs as required in the GCF SFL would be useful.

Ontario Ministry of Natural Resources: OMNR Hearst District staff and, in particular, Kapuskasing area office staff were closely involved in the audit, participating in all

meetings and assigning representatives to accompany the auditors each day in the field. During the audit, various personnel from the OMNR were interviewed including the District managers, area supervisor, area foresters, area biologist, and the senior forest technician. District staff were cooperative in assisting the auditors with retrieving information and files required to conduct this audit. Input from OMNR staff corroborated many of the findings described throughout this audit report. Concerns expressed during interviews with the staff are described and addressed throughout this audit report.

OMNR Corporate and Regional representatives participated in the audit by attending meetings and accompanying the auditors for portions of the field visits.

Tembec: The staff of Tembec was completely involved in the audit, providing information and reports to the auditors, attending meetings and accompanying the audit team in the field at all times. Interviews were held with 10 current employees of the Company, all of whom were helpful and responsive to questions from the audit team. Information was submitted in a timely fashion when requested by the auditors.

Input from Company staff confirmed many of the findings described throughout this audit report. Concerns expressed during interviews with the staff are described and addressed in various sections throughout this audit report.

Documents reviewed: The following list summarizes the documents reviewed by the audit team:

- Sustainable Forest License
  - Sustainable Forest License (License No. 550039) granted to Spruce Falls Inc. May 9, 2001.
  - Amendment to Sustainable Forest License No. 550039. November 18, 2003.
  - Amendment to Sustainable Forest License No. 550039. March 7, 2005.
- Forest Resource Licenses
  - License Nos. 550629, 550642, 550645, 550650, 550652, 550656, and 550661.
- Overlapping Licenses Agreements for Spruce Falls Inc.
- Independent Forest Audit reports, action plans and status reports
  - Gordon Cosens Forest Independent Forest Audit Report: 1995-2000. February 12, 2001. Prepared for Ministry of Natural Resources by KBM Forestry Consultants Inc. Thunder Bay, Ontario.
  - Kapuskasing Management Unit Independent Forest Audit Report: 1995-2000. February 7, 2001. Prepared for Ministry of Natural Resources by KBM Forestry Consultants Inc. Thunder Bay, Ontario.
  - 2000 Independent Forest Audit Action Plan Approval for the Gordon Cosens Forest. Approved January 25, 2002.
  - 2000 Independent Forest Audit Action Plan Approval for the Kapuskasing Management Unit. Approved March 27, 2002.
  - Kapuskasing Management Unit 1995-2000 Independent Forest Audit: Status Report. Approved May 28, 2004.

  - Forest Management Branch's summary/response to Kapuskasing Management Unit 1995-2000 Independent Forest Audit: Status Report. April 18, 2005.
  - Gordon Cosens Forest 1995-2000 Independent Forest Audit: Status Report. Approved February 8, 2005.
  - Forest Management Branch's summary/response to Gordon Cosens Forest 1995-2000 Independent Forest Audit: Status Report. April 15, 2005.
- Mission Statement and certification information
  - Tembec Vision and Mission Statement (www.tembec.com).
  - Certificate of Registration issued to Tembec, Northwest Ontario Forest Operations demonstrating that its EMS conforms with ISO 14001:1996. Issued by QMI April 22, 2004.
  - Certificate registering Tembec Industries Inc., Kapuskasing Sawmill as a SmartWood Certified Forest, managed in accordance with FSC principles and criteria. Certificate Registration Code: SW-COC-904. Valid March 15, 2003 to March 14, 2008.
  - Tembec Leaflet: A first in the Canadian boreal forest: Tembec announces the FSC certification of the Gordon Cosens Forest.
  - Tembec press release: Tembec's five-million-acre forest certification is the largest in Canadian History. Toronto, April 4, 2003.
- Comparison and Trend Analysis of Planned vs. Actual Forest Operations for the Gordon Cosens Forest. August 25, 2005.
- Documents evidencing auditee membership, participation, or support for forest research organizations (or persons) or research projects
  - Interlink. Forest Ecosystem Science Co-operative Inc. Issue No. 0003-05. August 2005.
  - Opening, Annual, and Project Closure Reports of Research and Development Projects. Fiscal years 2000-2004.
  - TemFIST R&D Report. Tembec. K.W. Durst. Fiscal year 2003.
  - The Forestry Research Partnership. Projects 120-001, 120-002, 120-203,130-002, 130-004, 130-005, 130-102, 130-208 (105), 130-301, 140-003, 140-004, 140-203, 140-304,160-201. www.forestresearch.ca. Downloaded August 23, 2005.
- Documents relating to internal directives or guides on environmental practices, including directives to mitigate/minimize environment impacts resulting from forest management practices, and emergency procedures for woodlands operations (standard operating procedures).
  - Forever Green Environmental Management Program Guiding Principles. Tembec. April 21, 2005.
  - Tembec Leaflet: A first in the Canadian boreal forest: Tembec announces the FSC certification of the Gordon Cosens Forest.
- Gordon Cosens FMP Mailing List
- Gordon Cosens Forest Local Citizens Committee Mailing List
- List of First Nation Communities that were engaged directly by the planning team for the 2005 Gordon Cosens Forest FMP and additional Communities that were on the mailing list for providing information.
- Terms of Reference: Kapuskasing Local Citizens Committee. April 23, 2003.

- 2000-2020 Forest Management Plan Gordon Cosens Forest Planning Team Minutes.
- Correspondence file and minutes of meetings of the Local Citizens Committee for the period being audited.
- Public notices including invitations sent directly to individuals or organizations, advertisements placed in the media, and any other notices issued such as flyers or posters.
  - For relevant Forest Management Plan(s)
    - Notice of Invitation to Participate
    - Notice of First Information Centre
    - Notice of Second Information Centre
    - Notice of Draft Plan Review
    - Notice of Plan Inspection
    - Notice of Minor Amendment Inspection
    - Notice of Major Amendment Inspection
    - Notice of Information Centre (for Minor and Major Amendments)
  - For the period being audited
    - Notice of Annual Work Schedule
      - Public Notices for Public Inspection of Annual Work Inspections. Northern Times, March 15, 2000; March 14, 2001; March 13, 2002; March 5, 2003; March 10, 2004; and March 2, 2005.
    - Notice of Herbicide and Insecticide Application
- Maps indicating where the application of pesticides has occurred.
- List of documents, exhibits and background information used at the Information Centres and any other public meetings held throughout the development of the Gordon Cosens Forest FMP.
- Minutes from Planning Team Meeting #18 where Information Centres were discussed. March 22, 2004.
- Attendance log for each of the Public Information Centres and other public meetings held throughout the development of the relevant Forest Management Plan(s) and a summary of comments received during those meetings.
- Notice of Native Consultation Forum (Review of the Preliminary Report on the Protection of Identified Native Values).
- Notice of Draft Plan Review and Native Consultation Forum (Review of the Final Report on the Protection of Identified Native Values).
- Notice of Plan Inspection for native communities.
- Forest Management Plan Terms of Reference
  - Gordon Cosens Forest (SFL 500600) 2000-2020 Forest Management Plan Terms of Reference. Spruce Falls Inc. Approved by Ontario Ministry of Natural Resources April 15, 1998.
  - Gordon Cosens Forest (SFL 500600) 2000-2020 Forest Management Plan Revised Terms of Reference. Spruce Falls Inc. March 26, 1999.
- Forest Management Plan(s)
  - 2000-2020 Forest Management Plan for the Gordon Cosens Forest. Approved January 12, 2000.

  - 2000-2020 Forest Management Plan for the Gordon Cosens Forest. December 22, 2002.
  - Gordon Cosens Forest FMP 2005-2025 Amendment #3 (Text).
- Map of Gordon Cosens Forest (Paper and Electronic)
- Reports of Past Forest Operations
  - Report of Past Forest Operations, Kapuskasing Management Unit, for the five-year term April 1, 1989 to Match 31, 1994.
  - Report of Past Forest Operations, Gordon Cosens Forest, for the five-year term April 1, 1990 to Match 31, 1995.
  - Forest Management Plan for the Gordon Cosens Forest for the twenty-year period April 1, 2000 to March 31, 2020: Report of Past Forest Operations.
- Supplementary Documentation for the relevant Forest Management Plan(s).
- Compliance plans
  - Hearst District Compliance Strategy 2002-2007.
  - Compliance Plan for the Gordon Cosens Forest. Spruce Falls Inc. For the one-year term April 1, 2000 to March 31, 2001.
  - Compliance Plan for the Gordon Cosens Forest. Spruce Falls Inc. For the one-year term April 1, 2001 to March 31, 2002.
  - Compliance Plan for the Gordon Cosens Forest. Spruce Falls Inc. For the one-year term April 1, 2002 to March 31, 2003.
  - Compliance Plan for the Gordon Cosens Forest. Spruce Falls Inc. For the one-year term April 1, 2003 to March 31, 2004.
  - Compliance Plan for the Gordon Cosens Forest. Spruce Falls Inc. For the one-year term April 1, 2004 to March 31, 2005.
  - Compliance Plan for the Gordon Cosens Forest. Spruce Falls Inc. For the five-year term April 1, 2000 to March 31, 2005.
- Annual Reports for the period being audited and for the period covering the relevant Reports of Past Forest Operations.
  - Gordon Cosens Forest Annual Reports 2000-2004 (Text and Tables).
  - Gordon Cosens Forest Annual Reports 2002-2003 (Maps).
  - Gordon Cosens Forest Annual Reports 2003-2004 (Maps).
- Harvest records for the audit period and the previous planning period including information such as year of depletion, stand number, area and volume.
- Depletion maps for the period being audited and the previous planning period.
- Silvicultural assessment records (including results of regeneration surveys, FTG surveys, and any silvicultural effectiveness monitoring conducted on the Unit).
  - FTG summaries 2000-2004
- Records regarding the basis for pesticide application and documentation of consideration of management options for areas eligible for insect pest management.
- A copy of the Post Operations Report for each aerial application of herbicide or insecticide.
- Requests for amendments to the relevant Forest Management Plan (s) including accompanying documentation (details of review, LCC recommendation, DM's decision, etc.) and master list of amendments.

- Bump-up requests and MOEE decision (including accompanying documentation such as correspondence file and minutes of meetings).
  - Bump-up requests and responses regarding the 2000-2020 Gordon Cosens FMP
- Reports for the Forest Management Native Consultation Program
  - Draft Native Background Information
  - Preliminary Report on the Protection of Identified Native Values
  - Final Report on the Protection of Identified Native Values
- Areas Selected for Operations maps (or allocation maps) for the relevant Forest Management Plan(s).
- Annual Work Schedules for the period being audited (including required maps and stand listings) and any revisions.
  - Gordon Cosens Forest Annual Work Schedules 2000-2005 (Text and Tables).
- Prescribed Burn Operational plans.
- Detailed inputs and results of forest decision support models such as SFMM, SEIM, LEAP and OWHAM for the relevant Forest Management Plan(s).
- Information regarding the current forest resources inventory (FRI) used in the planning process including maps, ledgers and tables and any updates to that information. Description of the methodology and responsibilities for collection, compilation and update of the FRI.
  - Gordon Cosens Forest Resource Inventory Update
  - Romeo Malette Forest Inventory Pilot Project: Practical Implementation. October 6, 2005.
- Maps and other relevant information for past forest inventories.
  - Poplar Decline Map
- Information on other formal inventory data on landforms, geology and soils used in forest management planning and implementation.
- Additional background information used by the Planning Team for the development of the relevant Forest Management Plan(s).
  - A Biological Diversity Strategy for the Gordon Cosens Forest 1995-2015 Timber Management Plan. R. Dean Phoenix and Paul Krabbe. November 29, 1994.
  - A Guide for Minimizing Site Disturbance and Site Damage on the Hearst Forest and the Gordon Cosens Forest. Draft. March 25, 2003.
  - Herbicide Tool Kit. Jeff Leach. July 2003.
  - An Assessment for the Presence of High Conservation Values on the Gordon Cosens Forest, Kapuskasing, Ontario, Canada. Version 7.03. December 2003.
  - Gordon Cosens Forest Aerial Tending & Chemical Site Preparation Operations Manual. Tembec. Kevin Del Guidice. 2005.
  - Wood Supply Comments for the Gordon Cosens 2005 Draft FMP. Bob Robinson.
  - Gordon Cosens Forest Biodiversity Strategy.
- Area Inspection Reports and/or Forest Operations Inspection Reports (produced by SFL holder and OMNR).
- List of charges laid or pending with the Ministry of the Environment, Ministry of Labour, Department of Fisheries and Oceans, or the OMNR. Documentation of any relevant EBR investigations.

  - Gordon Cosens Forest Summary of Charges Laid or Pending. September 22, 2005.
- Organizational chart indicating all forestry staff (SFL holder and OMNR District) and their professional designations and education background.
  - (Company) Organizational Chart. Forest Resource Management, Forest Operations, Northern Ontario West. May 1, 2005.
  - Tembec Forest Resource Management Group. August 2005.
- Documentation of training courses in safety, health, etc. related to forest management activities and a list of the staff attending (SFL holder and OMNR District).
  - (Company) Employee Training Records. September 9, 2005.
- Documentation of professional, technical or other courses, seminars and meetings attended by staff (SFL holder and OMNR District), which deal with aspects of their management activities, including those in which staff have acted as instructors or speakers.
- Details of Company, OMNR, and silvicultural contract staff training and instructional procedures relating to the use of pesticides, including list of staff involved and their qualifications and licensing by MOEE.
- Additional documentation
  - Plantation Details. 1951.
  - Second Amending Agreement to Forest Renewal Trust Agreement (Amended Trust Agreement 990316). March 25, 1999.
  - Gordon Cosens Forest Slash Management Strategy. December 2003. Updated September 2005.
  - Slash Pile Burning 2005.
  - Forestry Futures Trust Ontario Project Application Form. Tembec Inc. April 1, 2006 to March 31, 2009.
  - Gordon Cosens Forest Minimum Balance Sheets.
  - Specified Procedures Report: Summary of Findings. July 2005. Compliance with the Forest Renewal Trust. Compliance with the Forestry Futures Trust Agreement.